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Individual Tire Vulcanizers[1]

L. R. Keltner and H. Gray[2]

THE following abstract of the authors' paper describes in brief form the construction, operation, and advantages of individual or watchcase vulcanizers as they are frequently called.

The idea of vulcanizing or, as more frequently termed, "curing" pneumatic tires singly is not new. The watchcase vulcanizer, so-called because its hinged doors operate in a manner similar to the covers of a watch, has been used for curing a limited number of tire sizes since 1900. The best of these vulcanizers was a vertical type in which tires were cured in pairs. The 2 hinged doors were each half of a mold cavity, the other stationary halves being fastened back to back in the center (Figure 1).

The watchcase vulcanizer provides independent operation not obtainable with the heater press-conveyer system. It lacks, however, rapid interchangeability of mold equipment, sufficient capacity for large cross-section and small diameter tires, and adaptability to additional mechanical time savers. The necessity of overcoming these deficiencies, while keeping the flexibility of independent operation, led to the development of individual or unit tire vulcanizers. These are designed to cure sizes varying from the largest cross-section bus balloon to the smallest-diameter airplane tire. Their mechanical action is fully automatic. Every operation from the time the uncured tire is placed in the mold until the cured tire is removed from the lower bead-forming ring is performed without the aid of man power. In fact, the direct labor required for curing passenger-size tires is less than one minute of one man's time per tire.

Fig. 1. Typical Watchcase Vulcanizer

An individual tire vulcanizer comprises 4 general features: namely, the stand or frame, the steam-jacketed mold, the moving mechanisms, and the control and piping arrangements.

The frame is an exceptionally rugged construction of steel adequate to withstand the severe shocks and stresses developed during the opening and closing of the press, as well as when the locking mechanism or holding hydraulic pressure is applied to the mold. The base of the frame is either set in concrete or bolted securely to the floor, thus providing a substantial foundation upon which the steam-jacketed mold, the bearings of the moving mechanisms, and the piping may be mounted.

The steam-jacketed mold is a conventional tire mold with a steam cavity surrounding the outer surface of each half. The jackets are so constructed that the closed mold may be within a few degrees of a horizontal plane and still produce a uniform temperature distribution over the entire surface of the mold in contact with the tire. This most essential feature is secured by a complete drainage of the steam condensate at all times. The mold is so designed that its solid metal sections are as thin as it is possible to make them and still to provide adequate strength. This construction is especially true of the mold registers. Thermocouple temperature-distribu-

[1]Presented before the Division of Industrial and Engineering Chemistry at the Symposium on the Design, Construction, and Operation of Reaction Equipment. *Ind. Eng. Chem.*, Nov. 1, 1932, pp. 1259-63.

[2]The B. F. Goodrich Co., Akron, O.

tion tests show a variation of less than 1° C. (1.8° F.) over the entire curing surface of these molds. The fact that most accelerated rubber compounds approximately double their speed of vulcanization with each 6° to 8° C. gain in temperature explains the need of such uniform surface temperatures.

The stationary half of the steam-jacketed mold is fastened by 4 bolts to a heavy circular plate which is a part of the frame. The moving half of the mold is similarly mounted to a circular plate which is connected directly or indirectly to a short-stroke double-acting hydraulic cylinder. When connected directly, the circular plate attached to the movable half of the mold is mounted on the end of the hydraulic piston. Hydraulic pressure is then employed to hold the mold closed during the cure, as well as to perform the mold opening and closing operations. When connected indirectly, the force from the hydraulic piston is multiplied through a series of lever arms to open and close the mold and operate a mold-locking mechanism. In this case the stroke of the hydraulic piston closes the mold and then operates the mold-locking mechanism.

The hydraulic cylinder is mounted near its lower end on bearings in either side of the frame. On this axis the angle of the cylinder may be raised or lowered during the opening or closing operation. By mounting the cylinder in this manner, a closure of the mold is effected with the registers of the 2 halves parallel for at least the last 6 inches of the piston stroke. This position is desirable both from the standpoint of wear on the mold registers and of the prevention of surface defects on the cured tire.

The action of the lower bead curing ring during the opening and closing of the mold is an important mechanism. While the mold is closed, both the upper and lower bead ring fit together to form a rim for the bagged tire. As the mold is opening and the piston stroke is approximately half completed, the lower bead ring is raised away from the mold, thus lifting the cured tire from the mold, eliminating additional heating or overcuring due to a lack of prompt attention.

By an automatic controller all the mechanical and curing operations of the vulcanizer can be performed exactly to a predetermined schedule. Briefly, the controller proper consists of an electrically driven cam arrangement which actuates various air relay valves to throw air pressure on or off of diaphragm operating valves, causing them to open or close the various pressure supplies employed in the operating and curing action of the vulcanizer.

Where the same curing schedule is in use on more than one mold, it is possible so to arrange the control piping that several vulcanizers can be operated by the same controller. This economy is made possible by the fact that the uncured tire does not come into contact with the mold until it is closed. Thus several tires can be laid on their respective bead rings, and several molds closed at the same time by one controller.

The piping requirements for a unit of individual tire vulcanizers is relatively simple. In general the headers provide for a low hydraulic operating pressure (250 to 300 pounds), a controlled external steam supply for the jackets, high-pressure hot water, steam, or air for the forming bag, and a disposal for the steam or hot water blown out of the bag at the end of the cure, together with the jacket condensation.

For vulcanizers which use direct hydraulic pressure to hold the mold closed during the curing process, an additional high-pressure hydraulic supply (1,000 pounds) is required.

When only one external curing temperature is employed, a single header may be used to supply steam to the jackets of 2 rows of 10 molds. By using proper insulation this work can be done with a temperature loss of less than 0.5° C. from end to end. The steam pressure on the header is controlled by a pressure regulator.

The piping requirements for the internal heat and pressure supply to the bag vary considerably with the type of cure to be used. If high-pressure hot water is to be circulated through the water bag, piping for an inlet and outlet are provided. When steam, air, or hot water in a static form is employed, a single pipe is used as a common inlet and outlet. In single-pipe systems the length of pipe from the supply headers to the bag connection should be held to a minimum and all feed lines be well insulated. This precaution insures against excessive loss of heat from the steam or hot water before it reaches the bag.

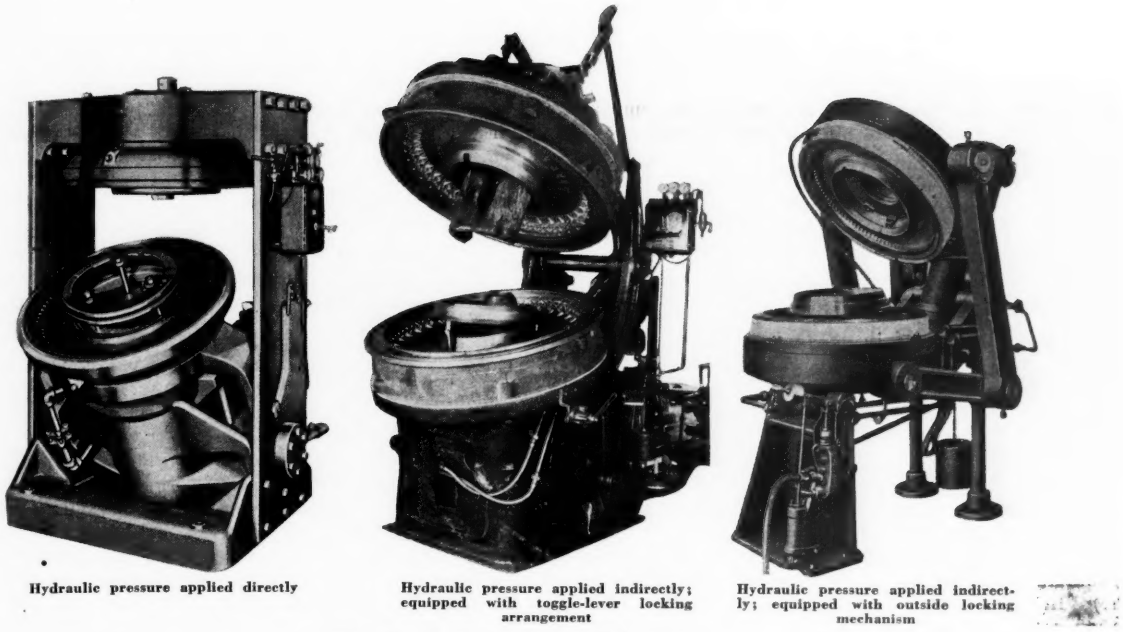
In the operation of an individual tire vulcanizer the uncured bagged tire is placed on the raised bead ring by the operator, who then presses a lever which releases a safety catch for keeping the mold open and starts the controller that closes the mold. The lower bead ring lowers the tire into the mold, and just as the closure takes place, the rings come together to rim the tire. At the same moment the bag stem is automatically connected to the internal inlet pipe, and after a few seconds internal steam, air, or hot water is turned into the bag. A predetermined time schedule is then carried out by the internal temperature and pressure mediums; for example, steam is turned into the bag for 15 minutes, followed by internal hot water for 30 minutes, or hot water is circulated through the bag for 40 minutes. At the end of this period, which is approximately 3 to 5 minutes before the cure is over, the internal blow-off is opened, and the internal pressure is released. At the appointed time the press starts to open, the bag stem connection is automatically disconnected, and the cured tire is broken from the top half of the mold. As the press continues to open, the tire is extracted from the lower half of the mold, and at the end of the ram stroke the safety catch engages to hold the press in the open position. The operator then lifts the cured tire from the lower bead ring, places it on a conveyer, removes an uncured tire from the same conveyer, and lays it on the lower ring ready for another curing cycle.

A direct comparison of the individual vulcanizer *vs.* the conventional heater press-conveyer method for curing pneumatic tires shows the former to possess many superior qualities. Curing in individual vulcanizers permits the use of the fastest curing compounds that can be otherwise processed. Each tire is cured for the time and temperature which will produce maximum physical properties throughout. The control of both curing time and temperature is maintained with a greater degree of accuracy, and the opportunity for mistakes due to the human element is greatly reduced.

Curing defects or blemishes are reduced to a minimum by the individual vulcanizer method. Also, the mechanical registering of the 2 halves of the mold eliminates excessive overflow or rind from the tire. The direct labor necessary is considerably less than that required in heater press operation. With an average change time of 30 seconds for small-size tires, one man can attend as many as 100 individual molds, depending upon the length of cure.

The initial cost of a unit of individual vulcanizers is approximately the same as that of a heater press-conveyer setup of equal curing capacity. The mold investment, however, is appreciably less for the individual method than for the heater press. Despite the fact that the actual cost of a steam-jacketed mold is higher than the conventional type mold, the number required for equal curing capacity is considerably less, owing to the difference in time of their curing and operating cycles.

From the standpoint of operating cost the individual vulcanizer shows a lower figure. Cooling water is not required. Steam service requirements are, on an average, 20% lower than the heater press-conveyer method; whereas hydraulic, power, and maintenance demands also contrast sharply in favor of the individual type mold. The large saving in steam is effected by the elimination of warming the molds and heater during each curing cycle, the utilization of shorter cures, and the efficient insulation of exterior mold surfaces.



Hydraulic pressure applied directly

Hydraulic pressure applied indirectly; equipped with toggle-lever locking arrangement

Hydraulic pressure applied indirectly; equipped with outside locking mechanism

Fig. 2. Individual Tire Vulcanizers

Hydraulic service demands are lessened, both in the volume required and the number of different supply pressures used. Power requirements are reduced to a great degree since all motor-driven conveyers and auxiliary labor-saving machines are either eliminated or incorporated in the action of the individual vulcanizer itself.

There are several disadvantages of the individual vulcanizer which, to date, have not been overcome. The most important is the time required to change the steam-jacketed molds. In the case of the heater press-conveyer system, production on a new mold may be started merely by pushing it on to the conveyer, which takes only a few minutes. In the case of the individual vulcanizer, at least 30 minutes are required to make a mold change. This point means that, when curing only a few tires, it may be more economical to cure in a heater press than in an individual vulcanizer. It is also true that additional care and planning are required in scheduling production for an individual vulcanizer unit.

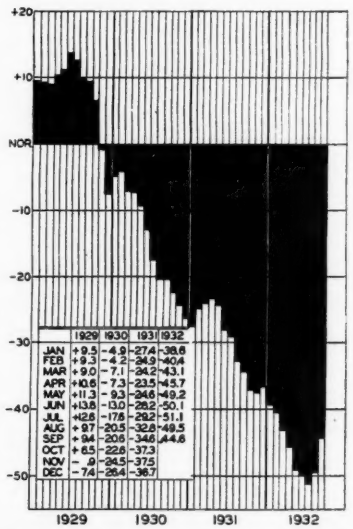
This recent development of individual unit tire-vulcanizing equipment which has here been discussed is of great interest and importance to the rubber industry. It is believed that the tangible and intangible savings effected by the process over the conventional tire-curing methods combine to make it very attractive for future considerations.

Business Activity

1929 to September, 1932

THE volume of industrial production increased sharply from August to September. In August it was 49.5% below the computed normal level, and in September it was only 44.6% below. This is an increase of nearly 10%, which is greater than any previous increase in one month on record.

The data in the small table within the diagram bring the index as nearly up to date as the available figures will permit. The data used are records of industrial production compiled by the Federal Reserve Board and adjusted by this bank to show the percentage fluctuations above and below the computed normal level. One of the long diagrams[1] referred to carries the record of business activity in this country back by months to 1790, and it is of interest to note that the percentage increase from August to September of this year is greater than that of any previous single month in that long span of 143 years.



	1929	1930	1931	1932
JAN	+9.5	-4.9	-27.4	-38.8
FEB	+9.3	-4.2	-24.9	-40.4
MAR	+9.0	-7.1	-24.2	-43.1
APR	+10.6	-7.3	-23.5	-45.7
MAY	+11.3	-9.3	-24.6	-49.2
JUN	+13.8	-13.0	-28.2	-50.1
JUL	+12.6	-17.6	-29.2	-51.1
AUG	+9.7	-20.5	-32.8	-49.5
SEP	+9.4	-20.6	-34.6	-44.6
OCT	+6.5	-22.6	-37.3	
NOV	-.9	-24.5	-37.5	
DEC	-7.4	-26.4	-36.7	

Almost every important element in the index showed advances from August to September. In manufacturing output there were especially noteworthy increases in iron and steel, textiles, food products, leather and shoes, cement, and tobacco. In mining the largest advances were those in the output of coal, with the percentage increases in anthracite exceeding the important improvement in bituminous production.

It now seems probable that the July record of 51.1% below normal will prove to be the lowest record of this depression. Previous low records for earlier great depressions include those of 27.0% below in 1921, one of 19.1 below in 1843, and one of 22.0% below in the Embargo depression of 1808.

Business Bulletin, The Cleveland Trust Co., Cleveland, O.

[1] India Rubber World, July 1, 1931, pp. 112-13; Feb. 1, 1932, p. 52, and Oct. 1, 1932, p. 38.

Accidental Injury Rates

In the Rubber Industry, 1931[1]

INJURY experience in the rubber industry during 1931 was favorable, but not quite so good as in 1930. In 55 reporting plants with an exposure of over 112,000,000 man-hours, lost-time injuries were 11.78 per 1,000,000 hours worked, and days lost were 1.03 per 1,000 hours worked. These injury rates are below the averages of 15.12 for frequency and 1.72 for severity in all industries and give rubber companies a standing of tenth in frequency and ninth in severity among 28 major industrial groups. In 1930 the industry ranked sixth and fifth in these rates.

Twenty-five plants have reported consistently for 3 years. In these plants the 1931 frequency rate is 30% below the 1929 rate, but slightly higher than in 1930. (See Figure 1.) In severity 1931 experience is worse than for either 1930 or 1929. In all industries combined frequency rates are down 38% and severity rates 19%, from 1929. Year-to-year comparisons of this character are most accurate when based on records of consistently reporting organizations.

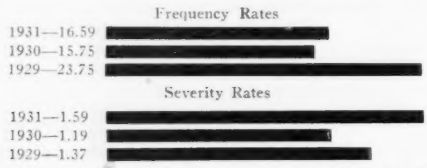


Fig. 1. Frequency and Severity Rates of 25 Units Reporting in 1931-1930-1929

Serious injuries are responsible, for the most part, for adverse experience in 1931. But temporary disabilities, also, were more numerous than in 1930 and showed no change in severity from 1929. The 1931 fatality rate is higher than for either of the 2 previous years. (See Table 1.) Also the frequency of permanent partial disabilities rose steadily from 0.46 in 1929 to 0.83 in 1931. This increase, however, has not been reflected in worse severity. Fatalities are the most important factor in the high 1931 severity rate.

TABLE 1

Injury Rates, by Type of Injury, Rubber Industry
(25 Units Reporting in Each of 3 Years 1931, 1930, 1929)

		Frequency Rate				Severity Rate			
Year	Man-Hours Worked (Millions)	Death and Perm. Total	Perm. Partial	Temporary	Total	Death and Perm. Total	Perm. Partial	Temporary	Total
1931	45.7	.13	.83	15.63	16.59	.79	.44	.36	1.59
1930	81.7	.04	.48	15.23	15.75	.22	.25	.72	1.19
1929	105.7	.09	.46	23.20	23.75	.57	.44	.36	1.37

Employment in consistently reporting plants during this period has dropped from 106,000,000 man-hours in 1929 to 46,000,000 in 1931, a decline of 57%. In industry as a whole working time is down 33% from 1929. These declines have probably meant the elimination of the newest employes and of hazardous construction and maintenance work, which should have affected rates favorably. Such influence may be offset by shifting employes from one job to another and by adverse psychological influences.

Among various branches of the industry 1931 frequency rates were highest in rubber reclaiming plants, 18.31, and lowest in rubber footwear establishments, 7.33. The former, also, had the highest severity rate, 3.52; tire manufacturing plants had the lowest rate, 0.79. Permanent partial disabilities were most numerous, in proportion to exposure, in mechanical rubber goods plants. Of the 7 fatalities in the industry 3 occurred in rubber footwear manufacturing. Lost time per temporary disability averaged 24 days in the entire industry and was lowest in mechanical rubber plants.

Excellent individual records were made in all divisions of the industry. Some of the leaders have kindly consented to permit the use of their names. The outstanding record was made by the Lycoming Rubber Co., Williamsport, Pa., which employed 1,600 people who worked 2,686,000 man-hours during the year without a single lost-time injury. This company is classified in rubber footwear, in which group plants averaged 7.33 for frequency and 1.46 for severity.

The frequency rate of the U. S. Rubber Reclaiming Co., Buffalo, N. Y., and the severity rate of the Philadelphia Rubber Works, Oaks, Pa., were also exceptionally good. The former had a rate of 5.87 compared with an average of 18.31, and the latter 0.12 in comparison to 3.52 for its group.

The best record for large tire manufacturing plants was made by the G. & J. Tire Co., Indianapolis, Ind., which averaged 2.88 in frequency and 0.25 in severity. The Dunlop Tire & Rubber Corp. of America, Buffalo, N. Y., led the small tire plants with a frequency of 6.42 and severity of 0.21. All plants of similar size average 22.16 for frequency and 0.82 for severity.

In view of the showing of the industry in comparison with previous years it is important for each plant to check its experience from year to year. When available, rates are given for 1931, 1930, and 1929. One of the best records for consistent improvement during the period was made by a mechanical rubber goods plant in which frequency has declined from 18.52 in 1929 to 12.89 in 1930 and to 8.73 in 1931. Severity dropped from 0.22 to 0.11 and to 0.07.

For the first time each record is ranked on the basis of both frequency and severity rates. Standings in each rate vary widely; members should observe carefully their rank in each rate. In rubber footwear plants the one ranking seventh in frequency was second in severity.

[1]Report of the Statistical Bureau, National Safety Council, Chicago, Ill.

TABLE 2

Lost-Time Injuries, 1931, Rubber Industry, by Industrial Groups

Industrial Group	No. of Industrial Units	Man-Hours Worked (Thousands)	Average Number of Employes	No. Lost-Time Injuries: Death and Perm. Total	Perm. Partial	Temporary	Total	Number of Days Lost: Death and Perm. Total	Perm. Partial	Temporary	Total	Injury Rates: Frequency	Severity
All groups	55	112,016	65,258	7	98	1,215	1,320	42,000	44,530	29,312	115,842	11.78	1.03
Rubber footwear	8	19,774	11,494	3	12	130	145	18,000	7,740	3,229	28,969	7.33	1.46
Mechanical rubber goods	26	25,459	12,009	2	25	246	273	12,000	11,800	5,370	29,170	10.72	1.14
Tire manufacturing	17	64,981	40,902	2	58	809	869	12,000	19,640	19,726	51,366	13.37	.79
Rubber reclaiming	4	1,802	853	0	3	30	33	0	5,350	987	6,337	18.31	3.52

Raincoats Again[1]

S. G. Byam[2]

ONE of the less pleasant features of the ordinary raincoat comes from the very characteristic which gives it its chief advantage, and that is the quality of imperviousness. To be waterproof a fabric is made practically airproof with a rubber film and consequently is hot and perspiration-inducing in warm weather. A garment that sheds water well, but is still porous enough to breathe would surely be more comfortable. Although raincoats that will do this are not ordinarily produced, they have existed for centuries. When La Condamine visited South America in 1731, he found the Aztec Indians of Quito wearing protective garments of fabric smeared with rubber latex, and also of material closely covered with feathers. These latter cloaks shed water readily and permitted a substantial circulation of air to the body of the wearer. The duck is naturally protected from water similarly, and it should not be amiss for man to take a lesson from the aborigines and from nature by providing himself with a water shedding, but porous material and thus obtain possibly a measure of added comfort.

It is not unlikely that rubber latex may be utilized to produce an impregnation of a specially woven and napped fabric that will provide both water resistance and permeability to air. Suppliers of rubber chemicals have prepared practically every necessary compounding ingredient in colloidal water soluble or paste form so that it may be added directly to latex. Such products disperse readily and do not coagulate the latex when properly used. With this advance in rubber technology already here, the commercial exploitation of latex coated fabrics will follow rapidly. The manufacturing chemist can readily handle latex with such help as the chemical houses will gladly supply him. That there are tricks in the handling of latex and applying it on fabric goes without saying and also that knowledge of them only comes with direct experience, but the advances made to date indicate that the progressive rubberizers will learn and exploit this new type of processing.

E. I. du Pont de Nemours & Co., Inc.

Doe-Tex Suede Raincoat—1932

[1]Continued from INDIA RUBBER WORLD, Nov. 1, 1932, pp. 31-33.

[2]Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

United States Rubber Co.

Bangor Model of Peachskin Suede Material—1932

Carlton Model Made of Latex Material—1932

The patent situation surrounding latex and its manifold applications is very complex, and a study of it is recommended as it will be productive of much useful knowledge. A thorough consideration of latex patents pertinent to the product or method of manufacture should be made by all who contemplate working in this field.

Among the more recent types of raincoat materials is the suede finish fabric, variously called Peachskin, Doe-Tex, etc. This material is very interesting because of its soft feel and attractive likeness to suede leather. It is made, of course, by simply applying ground cotton fiber to a suitably rubberized fabric. The manufacturing process, while simple in its basic elements, is far from that in actual manufacture. In fact it is extremely difficult to produce a uniform, evenly flocked material having the fiber well anchored into the surface so that it does not readily rub off in service. To accomplish this, various types of elaborate machinery have been devised: the results of which are the present very creditable products.

Suede fabrics have been presented to the trade in a fine variety of attractive colors and in extremely interesting embossed effects. Garments made from them are good simulations of those made of real suede leather, and it takes the most discerning eye to note the difference. The product has a world of applications in fields other than rain wear and, considering the times, seems to be having a well justi-

fied run of popularity. In the better grades of suede cloth, the cotton flock is so well anchored to the rubber surface that it will not completely rub off even under very severe abrasion. In making this material care must be taken to obtain exactly the proper length of cotton fiber, copper-free dyes for coloring the flock, and a very uniform application of fiber to the rubber. The adhesion of the flock to the rubber will depend not only on the composition of the rubber adhesive alone, but on the viscosity of cement at the time of flocking and on the fiber length of the flock itself. A final touch is a water repellent treatment of the flocked surface which literally makes water roll off it as it does from a duck's back. This treatment not only prevents the water soaking of the surface, but retards the soiling of the material as water soluble dirt is not carried into and left on the flock.

Chicago Rubber Clothing Co.

Chicago Regulation Policemen's and Firemen's Coats—1932

There is little new in finishes other than in embossing and printing designs. It is not unnatural that nitrocellulose lacquers should be supplementing and replacing shellac water varnishes because of their quick drying propensity and their sheen that can be adjusted to almost any degree of brilliance from a flat dull to a high glaze. These lacquers would be used more generally if it were not for the difficulties surrounding their anchorage to rubber, their tendency to discolor and darken badly when in contact with rubber containing antioxidants, and their lack of ability to withstand sunlight without cracking. These difficulties have been overcome with some lacquers, and their wider use has rapidly followed. The development of intermediate varnishes has been important in providing good bonding of the lacquer to rubber and in preventing the migration of antioxidant in the rubber to the nitrocellulose in the lacquer. This results in a reduction of surface discoloration without sacrifice of improved aging provided by the antioxidant.

The dry surface required in rubber surfaced raincoat materials, where not provided for by starching or nitrocellulose lacquers, has been obtained by treating the shellacked rubber with sulphur chloride or bromine. Though not used widely for this purpose until recent years, Parkes, the discoverer of the sincalore (Sine Calore) process of curing rubber in 1843, proposed the use of chlorine, bromine, and iodine to remove surface tack from rubber. Like so many other discoveries, this idea lay more or less dormant until an alert rubber technologist picked it up and applied it. No doubt he pulled himself out of some difficulty with the idea.

Another technical development that is becoming of considerable value in the manufacture of raincoat fabrics as well as other proofed goods pertains to the use of non-sulphur requiring accelerators, such as di-pentamethylenethiuramtetrasulphide. This accelerator has the faculty of carrying its own sulphur in chemical combination and the power of releasing a sufficient quantity in nascent form to produce vulcanization when subjected to curing temperatures. In view of the fact that no free sulphur exists either before or after vulcanization, all danger of sulphur bloom, which is the bane of dry heat cures for the proofer, is eliminated.

This type of accelerator is, of course, present in slightly higher concentrations when used without added sulphur than if sulphur is included in the formula. Stocks made in this way withstand working on the mills and calender without scorching, thus eliminating an annoying and costly condition so often present in making leatherette and similar calendered products. This factor of reasonable freedom from scorching, pile or bin burning, etc., is in itself enough to recommend di-pentamethylenethiuramtetrasulphide as an economical accelerator. Furthermore this same stock will cure adequately in dry heat at temperatures as low as 200° F.; while at 240° F. a practical cure is effected in 45 minutes. Because the necessary sulphur is provided by the accelerator, the stocks containing it will withstand the normal range of temperature variation present in practically every dry heat oven without reversion or serious overcure. Ease of handling, freedom from scorching and overcure, elimination of all tendency toward sulphur bloom, low temperature curing, together with economy of acceleration cost, make this accelerator a most attractive one for the rubberizer.

Not so long ago a publicity minded educator attracted a little interest by rashly announcing that the odor of rubber was one of the 3 worst, rating it with that of garlic and perspiration. He implied that an offensive odor existed in rubber products which was an important factor in sales resistance to them and rubberized fabrics in particular. That bad odor causes sales resistance, we admit, but that rubber products generally have an offensive smell every experienced rubber man will challenge quickly. It is conceded that improperly made rubber products may revert and decompose with a resulting foul odor that serves as a warning against the purchase of that product, but normal rubber products no longer decompose, at least until they have provided a measure of good service that is highly satisfactory to the consumer. Such materials have only the pleasant, cleanliness-suggesting odor of rubber that surely must invite rather than repel purchasing. Of course some organic accelerators and other chemicals on the market produce an unpleasant odor in rubber, but these are so readily replaced with equally or more suitable products that do not give offense that the former need not be used in raincoats or products of personal apparel.

The use of deodorants and odorizers in rubber is being studied and may result in the production of scented raincoats that suggest the dainty violet of spring or a rose garden of old England. It is, of course, not at all uncommon to find that smell of pine tar in rubber products which brings to mind the aroma of the northern forests. We believe, however, we need be little concerned with the elimination of the

plain, good old rubber smell that at its strongest is only a mild smoky odor. There is nothing new regarding odor in rubber. In an old issue of this journal[3] appears a reference describing dress shields made by the Columbia Rubber Co., Boston, which reads, "pure gum as soft as velvet and full of the clinging odor of a sweet perfume."

Possibly odorizing materials were important in those days when only wild rubbers were available. Most of us can recall the rank smells of Caucho and Africans to say nothing of that peer of rubbers, Upriver Fine.

Many people, some of whom are in the proofing business, are inclined to think that the raincoat business is in the class with a run-out race, but the writer ventures the opinion that such is not the case. If there is an overcapacity for production as a disadvantage on the one hand, there is the best technical means ever available for making fine attractive merchandise on the other. It must be admitted that saturation of the possible market is far from complete; therefore an opportunity exists of increasing the consumption in home markets. If the public is not raincoat conscious now, one can look back to the way the high color bombazine and brilliant leatherette caught the popular fancy; surely one should be optimistic enough to admit the possibility of a raincoat material doing so again. Raincoats are being produced for more people this year than 10 years ago, and the volume of raincoat business is off the high level of 1928 and 1929 less than is the case with most other branches of the rubber industry. These are facts that indicate definite and substantial accomplishments of the past. Surely they will be duplicated and surpassed in the future. If manufacturers are not yet making the ideal raincoat or raincoat fabric, they have eliminated much of the bad practice of the past and can at least produce a product superior to anything formerly made. If too many types of material are on the market at present, in time a natural elimination will occur of the impractical and the selection of a few which may well lead the way to more prosperous business.

[3] India Rubber World, July 1, 1890, p. 216.

The Functioning of Specifications

FORTUNATE is the chemist in a rubber factory making, for example, only rubber soles and heels, for he can boast of an extremely low number of mixings and specifications in operation; consequently their control is a relatively simple matter. Affairs in a general rubber goods factory are, however, quite different where the multiplicity of products soon results in the issue of many hundred mixings and specifications unless carefully watched; and advantage is taken of every possible opportunity to reduce the number. Such control must be regular to be of any value, for control which suddenly makes drastic cuts here and revisions there and then allows matters to take care of themselves for a further considerable period, only upsets an organization without effecting any lasting improvement.

Mixing Control

If a factory is to be run efficiently and yet with the minimum of mixings of various types and colors, mixing control is an art which repays careful study. Difficulties are met with in withdrawing an old quality used for some time by particular customers and with which they are quite satisfied; yet possibly new customers require something better, thus doubling the number of qualities for this particular purpose if the old customers are allowed to retain their previous quality. Obviously the correct procedure in all cases is to modify all mixings from time to time in the light of new experience and knowledge so that old and new customers may have the advantage of accumulated data. If the former are approached in the right manner, they can usually be made to see the advantage of the change from their own point of view. This is the particular work of sales departments, and the utmost cooperation between them and the chemists is essential to satisfactory mixing control. Their help is needed in the above and also in cases where a customer asks for a sample to be matched exactly. In many such inquiries it will be found that there is a very similar quality on the books of the firm which will serve the purpose admirably, but it requires tact to persuade the customer to accept the standard quality.

The sales staff should be alive to the necessity of continual mixing improvement and so anticipate any possible complaint about a product, which will surely arise if a mix is left for years without alteration. It is true of mixings that if they are not progressing, they are slipping backward as compared with those of the competitor.

The policy of passing on to a customer the actual number or name by which a mixing is known in a factory is not to be recommended because the customer will often demand to be supplied with that quality when the factory desires to displace it by something similar to avoid duplication of qualities, or by something which is considered better. This condition must cause confusion at the works; so it is always advisable for the sales section to adopt its own methods of distinguishing mixings so that while its system does not change, the works quality corresponding to a particular sales code may vary at will. In this way the customer always receives his rubber under the same designation, and considerable explanation is thus avoided.

Standards

Sales departments should be given a definite series of mixings to cover their varied requirements; and if this is carefully drawn up, very little alteration in the total number should be necessary. Similar consideration must be given to specifications for goods made from the mixings. The complications which can arise, for example, in a range of colored grip qualities, through the use of too many different types and colors, is amazing, and in a factory dealing with many different products thousands of specifications would be required to cover the varieties. As with mixings some arrangement should be made whereby only a limited number of possible variations is allowed. Obviously no hard and fast ruling can be laid down, for special orders are part of the daily routine of a general rubber factory and where these merit it, new qualities and specifications must be evolved to cover the production.

The influence of unchecked multiplication of mixings and specifications on the stock position in the factory is one of the most vital reasons for their control. Each mixing and specification involves a certain stock of mixed rubber or of material in progress in the factory. Idle stocks are accumulated, and these can rapidly assume a very alarming value. In the best run factory there will always be some stocks to work off in some manner into other products. If any mixing and specification is issued without investigation, an amount of material requiring disposal instructions soon reaches a figure which it is impossible to keep down by the usual methods of factory disposal, unless special measures are taken, and may involve serious loss through the use of the material in much cheaper products.

Distributers' Tire Stocks

In the United States as of October 1, 1932[1]

THIS report covers stocks of automobile tires held by both independent dealers and mass distributers. Returns from these 2 groups are discussed separately below.

Independent Dealers' Stocks

The regular semi-annual survey of tire stocks in hands of dealers, conducted since 1924 by the Rubber Division, shows the following comparable statistics, as of October 1, for stocks held by independent retailers in 1932 as against 1931. The number of reports received from dealers having stocks of casings was 4,636 less than in October, 1931. The average number of automobile casings per dealer was 71.3 on October 1, 1932, compared with 60.2 a year previous.

DEALERS' STOCKS OF AUTOMOBILE TIRES

	October 1, 1931			October 1, 1932		
	No.	Dealers Reporting	Average per Dealer	No.	Dealers Reporting	Average per Dealer
Total casings	1,617,366	26,882	60.2	1,586,833	22,246	71.3
High pressure casings	211,824	18,741	11.3	174,346	14,489	12.0
Inner tubes	2,185,505	27,062	80.8	2,077,616	22,517	92.3
Solids, etc.	20,947	1,096	19.1	14,380	712	20.2

High pressure casings, including both passenger car and truck sizes, which accounted for 13.09% of total stocks reported October 1, 1931, amounted to only 11.0% of the total reported this year.

The following table compares average stocks per dealer reporting each item on October 1st in the years 1924 to 1932, inclusive.

AVERAGE STOCKS PER DEALER ON OCTOBER 1

	1924	1925	1926	1927	1928	1929	1930	1931	1932
Total casings	53.6	56.6	49.9	57.6	64.8	68.4	62.4	60.2	71.3
Balloon casings	16.3	17.5	19.8	30.7	44.0	(a)	(a)	(a)	(a)
High pr. casings	(a)	(a)	(a)	(a)	(a)	22.9	14.5	11.3	12.0
Inner tubes	79.9	99.1	93.8	103.1	107.4	103.4	89.2	80.8	92.3
Solids, etc.	(b)	25.0	23.9	26.1	23.4	24.2	22.7	19.1	20.2

(a) Number of dealers not tabulated separately on survey indicated.
(b) Comparable statistics for 1924 not available.

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to similar data from the survey of October 1, 1931, as follows:

DEALERS CLASSIFIED BY VOLUME OF STOCK

	October 1, 1931			October 1, 1932		
	No. of Dealers	% of Total Dealers	No. of Casings	No. of Dealers	% of Total Dealers	No. of Casings
Less than 10	5,800	21.58	29,627	4,923	22.13	24,679
10— 24	7,860	29.24	125,098	6,118	27.51	97,231
25— 49	6,066	22.57	210,992	4,866	21.87	170,941
50— 99	3,989	14.84	272,610	3,311	14.88	226,580
100—199	1,764	6.56	234,045	1,670	7.51	226,934
200—299	562	2.09	132,545	528	2.37	125,159
300—399	286	1.06	97,313	249	1.12	85,053
400—999	424	1.58	250,794	414	1.86	243,877
1,000 and over	131	0.48	264,342	167	0.75	386,379
	26,882	100.00	1,617,366	22,246	100.00	1,586,833

Over 81% of the total reported stocks of casings held by independent dealers were in the hands of 28½% of the dealers.

Mass Distributers' Stocks

This section covers the stocks reported by the 2 principal mail order houses and their chains of stores, 2 supply companies merchandising special brand tires (one through its own stores, and the other through independent dealers and oil stations as well as those controlled by its marketing companies), a third independent chain system, and also stocks reported by 2 oil companies selling tires through their stations in several states. Each of the above reported their complete stock; in addition 3 tire companies reported the complete inventories of their company-owned stores. The stores operated by 4 other tire manufacturing companies were circularized, and returns were received from 40% of those stores.

The inventory actually reported as of October 1, 1932, is shown below. There are additional oil company stocks, and the stocks of 4 of the tire companies included are not complete. The stocks reported in the October 1, 1931, survey are also shown, but they are not strictly comparable.

MASS DISTRIBUTERS' REPORTED STOCKS

	October 1, 1931	October 1, 1932
Total casings	1,987,284	2,032,929
Inner tubes	1,847,440	2,109,690
Solid and cushion tires	3,350	2,285
High pressure casings	229,438	197,086

In the report of the survey for April 1, 1932, it was stated that mass distributers' complete stocks were estimated at 1,800,000 casings, 500,000 less than in the survey of October 1, 1931. Assuming that the tire company-owned stores, which did not submit reports were holding average stocks the same as those which did report their figures, the total mass distributers' stocks of casings are estimated at 2,450,000 on October 1, 1932, an increase of 150,000 over a year previous, and an increase of 650,000 over their April 1, 1932, estimated inventory. There is no basis for estimating stocks held by oil companies, selling through chains, from which reports were not received except as indicated previously. The total stocks of inner tubes held by mass distributers on October 1, 1932, are estimated at 2,475,000.

Summary

An idea of the true inventory position of the industry is given in the following statement, which is based on an assumption that there were 70,000 active independent tire dealers at the date of each of the last 3 surveys, plus estimated total stocks held by mass distributers, plus the inventory of manufacturers (incomplete) as reported by the Rubber Manufacturers Association, Inc. The statement is to be regarded as a sample of how such estimates may be made, rather than as an accurate statement.

INDUSTRY INVENTORY OF AUTOMOBILE CASINGS

	October 1, 1931 (Thousands)	April 1, 1932 (Thousands)	October 1, 1932 (Thousands)
Independent dealers' stocks	4,214	4,634	4,991
Mass distributers' stocks	2,300	1,800	2,450
Manufacturers' stocks	6,527	7,902	4,873
	13,041	14,336	12,314

[1]Special Circular No. 3,362, Rubber Division, United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

"EVERY FACT THAT IS LEARNED BECOMES A KEY TO OTHER facts," reads the current Blue Blotter of The Cleveland Liner & Mfg. Co., 5508 Maurice Ave., Cleveland, O.

Surgeons' Gloves[1]

PURSUANT to a request from the American Hospital Association, in cooperation with the Rubber Manufacturers Association, the Department of Commerce submitted to the industry on April 26, 1932, a recommended commercial standard for surgeons' rubber gloves and surgeons' latex gloves. The industry has since accepted and approved for promulgation by the United States Department of Commerce, through the Bureau of Standards, the following standards.

SURGEONS' RUBBER GLOVES[1]

Scope

1. This specification covers minimum requirements for material and workmanship of surgeons' gloves that are made of rubber.

Weights and Sizes

2. Gloves shall be supplied in medium and heavy weights and sizes 6 to 9½, inclusive. (See Table 1.)

Material and Workmanship

3. Gloves shall contain at least 95% by volume of best quality new wild or plantation rubber and shall be free from coloring matter or fillers, reclaimed rubber, or substitutes. The surface shall be smooth and free from ingrained particles, blisters, thin spots, or other imperfections.

General Requirements

4. Gloves shall have a rolled or banded wrist. (Manufacturers recommend the rolled wrist, which will be regularly supplied unless the banded wrist is demanded.)

5. Tensile strength.—The tensile strength of medium weight gloves shall be at least 2,700 lbs./in.[2] The tensile strength of heavy weight gloves shall be at least 2,400[2] lbs./in.[2]

6. Elongation.—The ultimate elongation shall be at least 600% (1 inch to 7 inches).

7. Resistance to sterilization.—A sample shall be wrapped in gauze and subjected to 5 successive sterilizations in steam at 15 pounds' pressure for periods of 15[3] minutes each, with intervals of 20 minutes between sterilizations. Test strips shall remain at room temperature for 24 hours before being tested. The tensile strength after this test shall be not less than 1,500 lbs./in.[2] on mediums and 1,200[4] lbs./in.[2] on heavies.

Detail Requirements

8. The length, width, and weight of gloves shall conform to Table 1.

TABLE 1. MEASUREMENTS AND WEIGHTS OF SURGEONS' RUBBER GLOVES

Size No.	Length from Tip of Middle Finger to End of Gauntlet, Minimum Inches	Circumference of Palm at a Point Between Base of Index Finger and Thumb (±5%) Inches	Weight Per Dozen Pairs	
			Medium (Minimum) Ounces	Heavy (Minimum) Ounces
6	10	6	8¾	11¾
6½	10	6½	9¾	12¾
7	10	7	10¾	13¾
7½	10½	7½	11¾	14¾
8	10½	8	13	16
8½	10½	8½	13¾	16¾
9	10½	9	14¾	17¾
9½	10½	9½	15¾	18¾

Marking

9. Each glove shall be marked with the manufacturer's or supplier's name or trade name.

10. Each package containing gloves conforming to this commercial standard shall carry a label which may read as follows:

These gloves are certified to conform to all requirements of the Commercial Standard for Surgeons' Rubber Gloves CS40-32.
(Signed) ————.

11. In lieu of the above certification the words "conforms to CS40-32," or other identification which may later be approved by the industry, may be substituted to conserve space. The use of this inscription shall indicate that the manufacturer (or supplier) subscribes to the above guarantee.

SURGEONS' LATEX GLOVES[5]

Scope

1. This specification covers minimum requirements for material and workmanship of surgeons' gloves that are made of latex.

Weight and Sizes

2. Surgeons' latex gloves shall be supplied in medium weight only and in sizes 6 to 9½ inclusive. (For details see Table 1.)

Material and Workmanship

3. Gloves shall be made directly from liquid latex. The surface shall be smooth and free from ingrained particles, thin spots, or other imperfections.

General Requirements

4. Gloves shall have a rolled edge at the wrist.

5. Tensile strength.—The tensile strength of fresh gloves shall be at least 3,500 pounds per square inch. Upon exposure in the standard Geer oven at 70° C. the gloves shall have a tensile strength of at least 3,000 pounds after 7 days, 2,500 pounds after 14 days, and 2,000 pounds after 21 days.

6. Elongation.—The ultimate elongation of fresh gloves shall be at least 820% (1 to 9.2 inches). After 7 days in the standard Geer oven aging test the elongation shall be 800%, and it shall remain so at the end of the 14- and 21-day periods in the Geer oven.

7. Resistance to sterilization.—A sample shall be wrapped in gauze and subjected to 5 successive sterilizations in steam at 15 pounds' pressure for periods of 15 minutes each, with intervals of 20 minutes between sterilizations. Test strips shall remain at room temperature for 24 hours before being tested. The tensile strength after this test shall be not less than 2,500 pounds per square inch. After 10 sterilizations the tensile shall be not less than 2,000 pounds per square inch.

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[1] Commercial Standard CS40-32. Effective for new production, July 6, 1932.
[2] The Federal Specification (ZZ-G-421) requires 2,700 lbs./in.[2]
[3] The Federal Specification (ZZ-G-421) requires 20 minute periods.
[4] The Federal Specification (ZZ-G-421) requires 1,500 lbs./in.[2]
[5] Commercial Standard CS41-32. Effective for new production July 6, 1932.

Detail Requirements

8. The length, width, and weight of gloves shall conform to Table 2.

TABLE 2. MEASUREMENTS AND WEIGHTS OF SURGEONS' LATEX GLOVES

Size No.	Length from Tip of Middle Finger to End of Gauntlet, Minimum Inches	Circumference of Palm at a Point Between Base of Index Finger and Thumb (± 5%) Inches	Weight Per Dozen Pairs (Minimum) Ounces
6	10	6	7¾
6½	10	6½	8¾
7	10	7	9
7½	10½	7½	9¾
8	10½	8	10¾
8½	10½	8½	11½
9	10½	9	12¼
9½	10½	9½	13

Marking

9. Each glove shall be marked with the actual manufacturer's name or trade name.

10. Each package containing gloves conforming to this commercial standard shall carry a label which may read as follows:

These gloves are certified to conform to all requirements of the Commercial Standard for Surgeons' Latex Gloves CS41-32.

(Signed) _____

11. In lieu of the above certification the words "Conforms to CS41-32," or other identification which may later be approved by the industry, may be substituted to conserve space. The use of this inscription shall indicate that the manufacturer subscribes to the above guarantee.

Maintaining Rubber Floors

THE Rubber Flooring Manufacturers Division of The Rubber Manufacturers Association, Inc., recently released its approved maintenance methods for rubber floors.

For polished floors the following is the procedure. After brushing the loose dirt from the floor, dip and wring out the mop, an ordinary string one, into the pail containing an approved cleaning solution; then mop a small section of the floor. Rinse the mop in a second pail of clear cold water and wipe the section clean of the solution. Rinse the mop in fresh cold water again and repeat the entire process until the whole floor is cleaned.

After it has dried, buff it thoroughly. For large areas is recommended any rotary electric power buffing machine with a stiff Palmetto bristle brush; for small areas, any weighted hand buffer to which is attached a piece of rough carpet or similar material as a buffing surface.

When all dirt and marks have been removed, the floor is ready for polishing. The polish is poured into a shallow receptacle, into which the applicator is dipped. Apply with a wiping motion a thin coat of polish over a small section. Never rub! Repeat the process until the entire floor is covered. After about a half hour, the usual time for the polish to dry until hard, buff it. Immediately apply a second thin coat and again buff thoroughly. The polish should be put on as thin as possible to avoid streaking. Always apply at least 2 coats. If the polish wears off in certain spots of the floor, clean and repolish only those parts.

The polish applicator may be of lambskin, soft absorbent cloth, or felt. The latter, of 4 or 5 strips ½-inch thick stood on edge and bound together, is very satisfactory. Applicators, however, are usually supplied by the polish manufacturers.

When the floor again becomes dirty, remove the loose dirt with a push broom and wipe the floor with a mop dampened with clear cold water. This mopping will not remove the polish. If this method is insufficient, use the detailed process of the second and third paragraphs. When necessary, the polish may be removed by scrubbing with the approved cleaning solution, utilizing hot instead of cold water.

For unpolished floors the process is the same as for polished ones except, of course, that no polish is applied. Incidentally, for both types of floors systematic buffings will reduce the number of necessary washings.

The cleaning solution consists of any approved cleaner dissolved in the proportions advised by the maker into a 12- to 16-quart pail of cold water. Never use warm or hot water, for it may remove the polish. In many cases clear cold water with or without ammonia is effective.

Lists of the aforementioned "approved" cleaners and rubber polishes may be obtained from the R. M. A.

Dyeing Transparent Balloons

TRANSPARENT balloons contain no colored pigment in the rubber mixing, but are surface dyed with aniline water soluble colors subsequent to vulcanization.

Such balloons are made almost exclusively for the street fakir, circus, and carnival trade. They are practically always inflated with gas to render them buoyant and are not intended to be blown up by the mouth. Therefore, although the color on all water dyed balloons will crock or wear off, this detriment is not so vital as if they were sold deflated.

The transparent balloons are made of high grade rubber and are a light brown shade when cured. Pure Para gum gives an almost colorless balloon, but is seldom used. The initial color of the balloon stock seems to have very little influence on the dyed color of the goods. They are dyed with basic colors in a machine similar to a laundry washer.

Dyeing is effected with the addition of 2% acetic acid, although it is understood that some colorists recommend the use of 2% caustic soda. The temperature and length of time vary. Experience shows that a temperature of about 160° F. maintained for an hour is better than a higher temperature and a shorter time. The dye bath is not exhausted and should be used continuously as a standing bath. The amount of dyestuff needed to bring it up to strength is roughly half the original quantity, but may vary with the amount of water used and weight of goods and number of pieces dyed.

After dyeing, the balloons are rinsed in warm water, washed in soap, again rinsed, and finally dusted with soapstone. One manufacturer finishes the balloons by a special method which eliminates tackiness without the use of soapstone. This method gives the balloons a slightly hazy appearance.

A balloon that has been dyed and rinsed will crock slightly even after it has been treated with soapstone; and if rubbed with moist hands, considerable color will come off. Red is the worst offender in this respect. The lighter the color and the better the rinsing the less this trouble will be.

The dyestuffs used are basic colors selected for their suitability. The colors in common use are orange, bluish red, bright red, violet, blue, and green. The customary amount to use of any of these colors is 1% except the orange and of that 1½% is required.

Several manufacturers formerly produced transparent balloons by passing the finished goods through benzol or other solution of an oil color. Some oil soluble colors are still used by the rubber trade, but they are applied mainly during the compounding of the rubber and not as dyes. It is not safe to use every oil color for this purpose as a number of them are changed or bleached during the curing process; therefore selections must be made as based on experience.

Compounding Latex

Joseph Rossman, Ph.D.

THE following concludes the information on United States patents relating to the compounding of latex, from our November 1, 1932, issue.

144. Fischer, 1,803,178, Apr. 28, 1931. Expansion joint material is made from 70 to 95% of clay, from 4 to 25% of oil, and from 1 to 5% uncoagulated latex.

145. Lane, 1,807,244, May 26, 1931. An adhesive composition contains from about 5 to 15% of latex, 17 to 40% rubber, 1½ to 5% rosin, 3 to 12% any tacky rubber, 3 to 10% soft copal, 6 to 25% zinc oxide, 3 to 18% lithopone, and from about 6 to 25% gutta percha.

146. Hopkinson, 1,808,225, June 2, 1931. An adhesive composition for leather consists of latex equivalent to 100 parts by weight of dry rubber, 20 parts dextrine, 2 parts zinc oxide, 2 parts sulphur, 4 parts glue, 2 parts oxy normal butyl thiocarbonic acid disulphide, which is a derivative of carbon disulphide, emulsified in solvent naphtha as indicated below, 2 parts dibenzylamine also emulsified in solvent naphtha, 2 parts Silurian shale. In combining these substances the following is the procedure.

The sulphur and zinc oxide are added to the dextrine and Silurian shale as a thick wet paste. An emulsion of oxy normal butyl thiocarbonic acid disulphide is made by dissolving 5 parts of this material in 40 parts of solvent naphtha, which mixture is then emulsified with 60 parts of water in the presence of 5 parts of glue. Quantities of each of these emulsions equivalent to 2 parts of the oxy normal butyl thiocarbonic acid disulphide and the dibenzylamine respectively are now added to the latex mixture. This composition is a fluid mass, which is applied to the flesh side of each of 2 sheets of leather and allowed to penetrate. A second coat is then applied, if desired, and allowed to stand until evaporation and absorption have occurred; whereupon the surfaces are firmly pressed together. Upon standing a vulcanized bond results.

147. Levi, 1,811,695, June 23, 1931. This invention is an improvement of patent No. 1,717,248. The following example is given: 20 liters of latex of a dry rubber content of about 35% and preserved with 4% of ammonia were heated at 45° C. for 2 hours under gentle agitation, the alkalinity being maintained substantially constant. To the liquid after cooling to room temperature were added: 200 grams zinc oxide in fine suspension in 200 cc. of water, 300 grams ammonium sulphate in solution in 1,200 cc. of water, 400 grams sulphur in fine suspension in 400 cc. of water, 40 grams tetramethylthiuram disulphide in fine suspension in 200 cc. of water. After about 5 hours a form for bathing caps, previously heated to 90° C., was dipped into the dispersion for about 5 to 8 seconds and then removed. The form was covered with a layer of rubber, which after drying was found to be substantially 1 mm. thick.

148. Teague, 1,826,192, Oct. 6, 1931. Latex is thickened and stabilized for coating or extruding purposes. For spreading on cloth the following formula is given: 100 parts dry rubber by weight (as a concentrated latex containing about 60% rubber by weight), 90 parts whiting by weight, 30 parts litharge by weight, 5 parts pine oil (as 60% emulsion), 25 parts light spindle oil (as 60% emulsion), 2 parts glue by weight, 2.5 parts sulphur by weight, 5 parts the condensation product of acetaldehyde and aniline prepared in acid solution by weight, 234 parts water (total amount including that used in latex and the emulsions).

The materials are compounded thusly. The whiting, litharge, sulphur, and condensation product, which acts as an oxidation retarder, are mixed together dry. To this mixture is added the glue in solution, and sufficient water to make the mixture pasty. It is then rendered smooth by passing it through a paint mill, to which is then added the remainder of the water, except that in the latex and emulsions. The pine oil and the spindle oil, each having been previously emulsified in water, are now stirred into the latex; after this action the filler paste is also added. The whole is allowed to set for 4 hours or longer as desired. In the time stated the compound sets to a thick gel so that it can be conveniently handled with a trowel for placing before the knife on the spreading machine.

In the above example the litharge is the setting or thickening and stabilizing agent and it also acts as a curing ingredient. After coating the fabric with the compound it is thoroughly dried and vulcanized by placing it into a hot-air box and raising the temperature in about ½ hour to 260° F. and maintaining this temperature for about an hour. By substituting 3 parts of lead thiosulphate for the 30 parts of litharge a mixture can be obtained to thicken in 1 hour.

Other compounds which may be used are basic lead acetate, lead acetate with a protective agent, lead hydroxide, the products of the reactions between lead oxides or salts and mono, di, and poly-saccharoses, lead chloride, bismuth hydrate, ferric oxide, ferrous lactate, basic ferric acetate, ferrous oxalate, stannous oxalate, and cadmium sulphide.

149. Dunham, 1,826,392, Oct. 6, 1931. The invention resides in the addition of the Edeleanu extract (obtained by extraction of petroleum distillates with liquid sulphur dioxide in the refining of the distillates, such extract being a by-product of the refining operation) to rubber latex to effect a softening of the shells of beta rubber of the various rubber particles, whereby a rubber product formed from the latex will have a relatively dense structure substantially free from voids and will possess great tensile strength.

150. Trobridge, Murphy, Twiss, and Gorham, 1,828,481, Oct. 20, 1931. Sponge rubber articles are molded from a latex froth.[1]

151. Watkins and Holmberg, 1,828,990, Oct. 27, 1931. The method of making articles comprises continuously building up a deposit of rubber composition on a porous form by maintaining the form in contact with a body of aqueous rubber dispersion and withdrawing the dispersing agent through the form, drying the deposit, building up additional deposits of rubber composition by alternately contacting localized portions of the deposit with a rubber dispersion and with coagulant, and vulcanizing.

The following compound is used: 100 parts by weight of rubber as semicured latex containing 35% solids, 2 parts zinc oxide, ½-part carbon black, 2 parts sulphur, ½-part

[1]For details see "Latex Sponge Rubber," INDIA RUBBER WORLD, Dec., 1931, p. 63; *Ibid.*, Aug. 1, 1932, p. 36.

zinc dimethylamine dithiocarbamate, 5 parts sulphonated vegetable oil, 35 parts kaolin, 15 parts asbestine, 1 part glue, 0.1-part ammonium thiocyanate, 60 parts water, and 0.8 cc. per 100 ccs. of compound of sodium polysulphide. The kaolin and the asbestine act as filling agents; the glue as a stabilizer for the dispersion; the sodium polysulphide as a thickener; and the ammonium thiocyanate aids in accomplishing the thickening. The carbon black serves as a coloring agent; while the zinc oxide helps effect vulcanization.

152. Byrd, 1,831,226, Nov. 10, 1931. A waterproofing composition is made as follows: A bituminous material such as asphalt of rather low melting point is added to an aqueous paste of clay (about 2 parts of clay to one of water by weight) heated to a temperature below the boiling point of water, for example, 150-180° F. The bituminous material is added gradually, and the mixture agitated so that the colloidal clay and bituminous material are properly distributed. The colloidal clay is the emulsifying agent. Rubber latex is added to this emulsion and the mixture thoroughly stirred to insure a uniform product. The quantity of rubber latex added depends upon the amount of rubber desired in the final product. Ordinarily the ratio of latex suspension to the suspension of bituminous material is from 5 to 1 or as low as 1 to 5. Even where the rubber content of the mixture is from 20-30%, the composition is of low viscosity and at the same time has enough rubber so that the fabrics may be coated with sufficient thickness of coating material by one dipping.

153. Vogel, Brown, and Hill, 1,834,481, Dec. 1, 1931. Latex is neutralized with acid to a pH value of about 8.5 to 9.5 and then treated with alkali to its original alkalinity. When a porous web of interfelted fiber is impregnated with the resulting latex and the web dried and vulcanized, it acquires leather-like characteristics.

154. Hill, 1,834,490, Dec. 1, 1931. Five per cent zinc oxide, based on the solids content of the latex, is added to ammonia preserved latex containing about 33 to 37% solids and having a pH value of about 10.5 to 11.0. The zinc oxide may be added admixed with water as a thick paste or slurry, and the latex heated to 75° C., which temperature should be maintained for about 30 minutes to insure complete reaction. After the heat treatment the latex should be allowed to stand in order to permit settling out of reaction products and excess zinc oxide.

A loosely felted web of refined wood pulp of high alpha cellulose content is dipped into the latex and then dried. The resulting product has a fiber-rubber ratio of 1 to 1. It is found that the ply adhesion of the product is increased from 100 (in the case of untreated latex) to 350 (in the case of treated latex); the arbitrary units given represent the resistance to the pulling apart of the 2 faces of the dried, rubber impregnated web after it had been split.

155. Schade and Trumbull, 1,834,973, Dec. 8, 1931. Rubber is electrodeposited from a dispersion of vulcanized scrap rubber and natural rubber latex.

156. Schade and Trumbull, 1,834,974, Dec. 8, 1931. Latex is mixed with an artificial aqueous dispersion prepared from a plasticized or masticated crude or vulcanized rubber, to produce a dispersion containing intimately and uniformly admixed original rubber globules and finely divided masticated rubber particles. This mixed dispersion may, either with or without further treatment, be employed in producing rubber articles directly therefrom, which will be composed of the homogeneously arranged unruptured rubber globules and finely divided plasticized rubber particles. By suitably regulating the proportions of the latex and the aqueous dispersion of masticated rubber, the properties of the rubber articles produced directly from a mixed latex and rubber dispersion can be varied to a considerable extent. The mixed dispersions are advantageous in the direct production of formed articles by electrodeposition upon an anodic body.

157. Quincy, 1,835,365, Dec. 8, 1931. A rubber-like coagulum is made by mixing fresh latex with a quantity of drying oil approximately equal in weight to the rubber in the latex, and adding to the mixture a quantity of a 40% solution of formaldehyde equivalent to about 2% of the combined weights of the oil and rubber in the mixture. The coagulum obtained is, after drying, approximately double the weight of the rubber in the latex and has the characteristics of a true rubber. It can be milled, vulcanized, and otherwise treated like pure rubber; its properties of tenacity, elasticity, etc., approximate those of pure rubber products of the highest grade, but vary somewhat according to the particular kind of oil or colloid combined with the rubber.

If desired, vulcanizing substances such as sulphur, zinc oxide, accelerators, etc., may be mixed with the latex and oil prior to coagulation. The presence of these substances does not interfere with the coagulation, but since they are uniformly distributed through the coagulum, the step of milling the rubber is thus obviated, with a saving of power and time.

158. Hill, 1,836,595, Dec. 15, 1931. Latex containing the water-insoluble calcium soap resulting from the reaction *in situ* in the latex of about 1% soluble soap based on the latex and about 10% calcium oxide based on the latex. When a web is dipped into or passed through the treated latex and subjected to drying, setting or coagulation of the rubber is considerably hastened, and the so-called "ply adhesion" or tenacity of bond between the face portions or layers of the resulting sheet is enhanced.

159. Hill, 1,837,162, Dec. 15, 1931. A specific example of procedure to modify the characteristics of latex so that it is suitable for manufacturing artificial leather for shoe insoles follows: An ammonia preserved latex having a solids content of about 33 to 37% and a pH value of about 10.5 to 11.0 may be used as a raw material. Into this latex is stirred sufficient soluble caseinate to prevent coagulation when slaked lime is later added for the purpose previously described. The soluble caseinate may be in the form of an aqueous solution of the ammonium caseinate of about 20% strength, which may be prepared by soaking about 7½% casein, based on the weight of latex solids, in water for about ½ hour, then adding strong ammonia water (28% aqua ammonia), and heating the mixture while stirring for about 15 minutes at about 60 to 70° C.

After the ammonium caseinate solution has been uniformly disseminated throughout the latex, about 7 to 10% slaked lime, based on the weight of latex solids, is added as in the form of a suspension or slurry in water containing about 10 to 25% lime. This amount of lime exceeds that actually needed to convert all the protective colloids present in the latex to an insoluble non-protective condition, but the excess not only insures the desired reaction, but also serves as a desirable filler or loading material in the final impregnated product. Being a comparatively insoluble material, lime is not objectionable in the impregnated product as it has no tendency to bloom. When the dried latex impregnated product is porous, as is the case of some artificial leathers, the lime doubtless becomes converted into calcium carbonate by the action of the carbon dioxide in the atmosphere. The treated latex may be diluted to the solids content desired for impregnation, to about 10 to 20% solids content when it is to be used for impregnating a porous web of interfelted cellulose fiber to produce an artificial leather product.

If desired, "direct dyes" which impart the color of vegetable-tanned leather to cellulose fibers, sulphur, accelerators of vulcanization, antioxidants, or other rubber compounding agents may be added to the latex before impregnation of the web is effected. The web may be impregnated as by dipping into the latex; whereupon the latex impregnated web may be squeezed to the desired rubber content, say, 40 to 60%, and then dried.

160. Williams, 1,838,241, Dec. 29, 1931. To ordinary commercial alkaline latex, a solution of ammonium chloride is added in insufficient quantity to cause coagulation, e.g., in the proportion of up to 20 parts by weight of ammonium chloride to 100 parts by weight of latex, and electrophoresis of this mixture of latex and ammonium chloride is conducted by using suitable electrodes of different materials connected to an external current of such voltage that the total voltage between the electrodes shall be approximately 1.5 volts, thereby effecting deposition of the rubber upon the anode. Fillers, such as zinc oxide or sulphur or other vulcanizing agents, with or without accelerators of vulcanization, which do not cause premature coagulation of the latex, may be added before introducing the electrodes.

161. Gunther, Hopff, and Schuster, 1,838,826, Dec. 29, 1931. Ten parts of latex are mixed by stirring or agitation at ordinary temperature with 0.2-part of the finely powdered sodium salt of a butyl-naphthalene-sulphonic acid. Ammonia or small quantities of other substances having an alkaline reaction may also be employed in addition to the sodium salt. In all cases the stability and wetting power of the latex so treated is considerably improved.

162. Cadwell and Meuser, 1,839,950, Jan. 5, 1932. A mix consists of 100 parts rubber, as ammonia treated latex of normal concentration, and 5 parts of ammonium thiocyanate, added as a water solution. This compound may be utilized in any desired manner for the direct manufacture of rubber articles such as impregnation of fabric, cords, etc., or the rubber may be recovered in any suitable manner as by dehydrating to obtain a solid rubber with much improved aging characteristics. Potassium thiocyanate may be used instead. Dicyandiamide may also be used to advantage.

As a further example illustrating the application of the invention to latex, 100 parts rubber, as vulcanized latex, may be mixed with an aqueous solution 5 parts ammonium thiocyanate. The vulcanized latex may be made in any suitable manner, for example, by using 100 parts rubber as ammonia free latex, ½-part oxy normal butyl thiocarbonic acid disulphide, ½-part dibenzylamine, 2 parts zinc oxide, 2 parts sulphur.

The following procedure may be used in incorporating the ingredients. The oxy normal butyl thiocarbonic acid disulphide and the dibenzylamine are each dissolved in an organic solvent, such as solvent naphtha, and aqueous dispersions then made of the solutions. Next these dispersions are added to the latex. The zinc oxide and sulphur are formed into a thin cream with water and glue and then added to the latex. The latex compound will vulcanize in about 2 weeks at 70° F., or instead the vulcanization may be hastened by heating after the compounded latex has stood for some time at ordinary temperatures. This cured latex compound, after addition of the age retarder, may be also directly applied in making rubber articles; or the vulcanized rubber may be recovered from the latex in any suitable manner.

163. Carson, 1,841,322, Jan. 12, 1932. A cement for uniting rubber to metal consists of 100 grams haemoglobin, 300 cc. water, 45 grams sulphur, 5 grams zinc oxide, 1 gram diphenylguanidine, 575 cc. latex (30% concentration), 10 cc. formaldehyde (40% concentration).

164. Twiss and Murphy, 1,846,164, Feb. 23, 1932. Latex for spreading, dipping, or deposition is compounded as follows: 8 parts of zinc oxide, 2.5 parts of sulphur, lamp black 1, talc 20, whiting 15, paraffin wax 2 (previously emulsified in water), mineral rubber 1 (previously finely ground), are mixed with 100 parts of water containing 0.1-part of caustic potash, 0.3-part of oleic acid, and 0.3-part of casein. A sufficient degree of dispersion for this stage can be attained in a few minutes. Enough ammonia preserved latex is then added to introduce 60 parts of rubber, caustic potash having been previously introduced into the latex so that the 60 parts of rubber are accompanied by 0.4-part of caustic potash. The whole is then mixed and concentrated by direct evaporation. A concentration to 75% total solids is convenient especially if the product is to be used for dipping operations.

At the completion of the concentration the mixture is allowed to cool. The agitation is still continued while ammonia (e.g. 1 part of concentrated aqueous ammonia of specific gravity 0.880) is added; an accelerator in suitable amount such as 0.3-part of diethylammonium-diethydithiocarbonate may, if desired, be introduced at the same time. It is desirable to continue the agitation for a few minutes until the ammonia (with any accelerator) is uniformly dispersed.

165. Darling and Powers, 1,846,820, Feb. 23, 1932. This patent describes a process of preparing organic dyestuffs for dispersion in rubber. It has been found that the product resulting from mixing with latex an aqueous colloidal suspension of a water insoluble color, coagulating, and milling possesses important advantages over the products hitherto obtained by merely mixing with latex the finely ground materials heretofore employed. When the coagulated latex containing colloidal coloring material is thoroughly milled, the resulting product will not only disperse much more easily, uniformly, and quickly than the unmilled produce, but is also plasticized.

A color prepared as outlined above has, in most instances, at least twice the tinctorial power of the same color dried, ground, and milled in accordance with the present practice. It is satisfactory for manufacturing very thin rubber sheets.

Two of the examples given are as follows: (1) To 1,000 pounds of a 10% suspension of an undried precipitate of Algol red R (Schultz No. 819) agitated in a kettle, 300 pounds of 33% rubber latex are slowly added. The viscosity of the mixture increases slightly, but no other change is noted. After 15 minutes' agitation the product is filtered, dried in a vacuum oven, and milled in an open 2-roll rubber mill for about 30 minutes. The resulting product, containing about 50% dyestuff, is practically as high in tinctorial power as an equal weight of pure dyestuff that has been filtered without this treatment, and dried, and ground to 200-mesh. (2) Five hundred pounds of a 12% suspension of an undried precipitate of Helindone orange R (Schultz No. 913) are agitated in a kettle, and 300 pounds of 20% rubber latex are slowly added. The mixture becomes much more viscous and is difficult to filter. Enough dilute acetic acid is slowly added, after the mixture has been stirred for 10 minutes, to make it faintly acid to litmus, and the product pressed on a filter and dried. When thoroughly milled as in Example 1, this product gives a very bright shade when 0.5% is incorporated with the rubber.

Linoleum Substitute

A RUBBER flooring product that is without the character of rubber, but similar in its properties to leather or linoleum is disclosed in a recent patent.[1] The body of the composition is sawdust or wood meal with mineral fillers, and the binding material is gasoline soaked rubber. The preparation of the mixture follows.

A mixture of 100 parts of rubber, 7½ parts of sulphur, ½-part of accelerator, 50 parts of lithopone, 75 parts of chalk, 200 parts of sawdust, and 100 parts of gasoline are massed on a rubber mill, and the mixture sheeted on a calendar to any desired thickness and applied under pressure to a jute fabric backing. The sheeted material is next dried to expel the gasoline and vulcanized 15 minutes in a press between platens heated to about 160° C. at a pressure of about 15 kilograms per square centimeter, equivalent to 320° F. at 212 pounds per square inch.

[1] U. S. Patent No. 1,868,787, July 26, 1932.

EDITORIALS

The Use of Rubber Latex

CONTRARY to general belief, the use of rubber latex is not new, but probably antedates that of crude rubber. Latex has been used for centuries by South American natives for waterproofing fabrics. Condamine, when exploring Peru in 1736, wrote to the Academy of Science in Paris, describing this process. In 1911 Pearson stated that natives of the Amazon stirred sulphur in latex and brushed it onto fabrics. In 1824 Thomas Hancock started work in England on rubber latex and took out 3 patents. He patented latex for making artificial leather in 1824; he patented a process in 1825 for the use of latex in the rope industry; and again in 1833 for impregnation of garments.

From this date on latex was largely forgotten; then Frederic Kaye in the Fall of 1921 patented the use of latex in paper making. Since that time the commercial development of latex has steadily increased until today it is being used in many divergent fields, such as paper, textiles, canning, adhesives, carpets, leather, and shoe industries. In latex commercialism a new rubber technology has arisen and evolved new processes and formulae which have resulted in a great number of patents, many of which are basic.

Government and Emergency Rubber

EVEN though remarkable progress has been made through private initiative in the cultivation in middle California of the guayule shrub as a rubber producer, and the Edisonian experiments with goldenrod in Florida for providing an emergency supply of home-grown rubber have been encouraging, the Government is still actively concerned with the possibility of extracting rubber from rapidly growing native plants in a grave emergency.

Most of the experimenting is being done in California. Stations are maintained at Shafter in Kern County, Torrey Pines in San Diego County, and in the Bard district in the more desert-like section of Imperial Valley near the Mexican border. In fact it is in the latter "acclimatization garden" that rubber is getting the main consideration in a quiet, persistent, scientific way. One of the plants is *Asclepias subulata*, the common desert milkweed, even though the rubber so far extracted is not yet, and may never be, a commercial proposition. It is a dull-green, leafless shrub 2 to 4 feet high, the stems of which are reported to give about 3% of rubber on a dry weight basis, and which may be raised to 5%, or perhaps 125 pounds to an acre.

As to other rubber-bearing plants, it is said that one Madagascar plant, *Cryptostegia grandiflora*, shows a marked tendency to flourish here, but a later importation, *Euphorbia intisy*, is not easily acclimated.

The Division of Cotton, Rubber, and Tropical Plant Investigation, headed by C. O. Cook and sponsored by the Department of Agriculture, has been carrying on this experimental work since the World War. In view of the importance of rubber to the nation, should foreign supplies be cut off, the efforts of our Government in developing home-grown rubber should be encouraged.

Ills of the Planting Industry

AS LONG as the rubber producers continue to pile up unnecessary stocks of crude rubber, there can be no betterment in the situation confronting the planting industry. The idea of certain owners that the policy of maintaining maximum tapping would eliminate weaker planters is false reasoning. If all estates had agreed to stop new production until the accumulation of stocks had been reduced to manageable proportions, the outlook at present would have been more favorable. As Eric Miller, the well-known British authority, says:

"It is a grave reflection on rubber growers in general that so many of them refuse to avail themselves of the means so readily at their disposal for the all-round improvement of their situation, and it is no excuse to point to the many other industries which are being run unprofitably, for reasons which are not dissimilar to those applicable to our case."

True there are a great number of estates which have stopped tapping entirely. In fact the Dutch native planters seem to have carried out a more consistent policy of output reduction than all the other producers in the Far East.

OF ALL THE FACTORS THAT HAVE PLAYED A PART IN building up great business enterprises and raising the standard of living of the American people none has been more efficient than the science of publicity. Yet the tremendous job which it accomplishes costs less than 2% of the total national income, a fact worth very serious consideration by every concern that is tempted to hinder its progress by mistaken economy in advertising.

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

Boston Group

THE Boston Group of the Rubber Division, A. C. S., held the first of its 1932-33 meetings on November 2, at the University Club, Boston, Mass., when 100 members partook of an excellent dinner and listened with satisfaction to an interesting program. By way of diversion a brief after-dinner period was devoted to a number of amusing anecdotes, stories, and song hits of past years.

Harlan A. Depew, of the Research Department, American Zinc Sales Co., Columbus, O., read an informative paper on the rubber making properties of zinc oxide, outlined in the following abstract.

In technical literature one does not find up-to-date adequate treatment of the technology of zinc oxide. In patent specifications, however, inventors have presented the subject in considerable detail as to past and present manufacturing practice and development of processes and product.

While the dosages of zinc oxide used in rubber compounding are smaller now than when its applications were fewer, it is used as an essential ingredient in virtually every rubber compound for activating the accelerator and imparting improvement to the physical properties of the vulcanized product.

Zinc oxide is manufactured from either of 2 sources. That in which the metal is vaporized by heat and oxidized is known as French process oxide. The product is free from sulphur and is not acid. That in which zinc sulphide ore is the source is known as American process zinc oxide and is acid. The reason for this is that sulphuric acid (SO_3) is adsorbed on the zinc oxide particles as the material.

The particle size of zinc oxide produced by the American process averages 0.15-0.35 μ. The uniformity of this average gives good dispersion of the material in rubber mixing and superior whitening effect by reason of its maximum opacity. Finer particles that closely approach the wave length of light not only do not whiten rubber so much, but refuse to mix readily with it. The coarser the particle of zinc oxide is the easier it can be milled into rubber, but it also has reduced whitening effect because of its lack of opacity.

American process or acid zinc oxide is desirable because it assists in the factory processes of milling, calendering, and tubing by making the mixture soft and the cured product flexible. The presence of the acid also prevents undesirable stiffening effect on the rubber caused by the zinc oxide-protein reaction. Acid accelerators should be used with non-acid French process zinc oxide, and basic accelerators with American process acid zinc oxide. Chemical quality rather than physical properties is the more important in testing zinc oxide for rubber making.

The "Business Outlook" was discussed in an informal talk by Ralph D. Wilson, vice president, Babson Statistical Organization, Inc., Wellesley Hills, Mass. The speaker referred to the periodic recurrence of depressions as the inevitable consequence of over expansion in industry, transportation, real estate, etc. Depressions are overcome by readjustments which again permit expansion that outdoes itself.

Akron Group

THE Akron Group, Rubber Division of the American Chemical Society, held its fall meeting on November 7 at the Akron City Club, where about 160 members and guests enjoyed a very excellent dinner and program.

Ward T. Van Orman, Goodyear pilot, gave a very interesting description of his flight over Europe in the international balloon races. He also described the return trip from Friedrichshafen to Bahia, Brazil, on the *Graf Zeppelin*. He stated that the commander of the airship predicted that they would arrive in Bahia about 73 hours after leaving Friedrichshafen, and they were only 35 minutes late. He compared this to the ocean trip from South America to New York when they were about 3 days late and the trip required 13 days.

W. E. Sykes, of the Farrel-Birmingham Co., Inc., gave a very interesting discourse on the developments of gears, which was illustrated with lantern slides. He explained many of the methods used in gear engineering successfully to meet the requirements of the rubber industry.

Chicago Group

THE Chicago Group, Rubber Division, A. C. S., began its 1932-33 season with a meeting at the Midland Club in Chicago, Ill., on November 11. The speaker on this occasion was William M. Welch, president of the Midwest Rubber Reclaiming Co. and vice president and general manager of the Akron Rubber Reclaiming Co. He reviewed the growth of the rubber industry and its extension from the Atlantic Seaboard to the midwestern states. In this connection the fact that 90% of the automobiles are manufactured in the latter section strongly influenced this westward trend of the rubber industry, resulting in mutual advantages to tire and automobile companies.

The speaker stated, however, that a recent survey showed that concerns in the West and Southwest purchase the majority of their rubber items from the eastern states although the rubber factories of the Midwest are admirably located to supply those markets.

S. Collier, chairman for the 1932-33 season, announced that 2 unusual features are planned for the next group meeting to be held about the middle of January. It has been decided to make the Hotel Sherman headquarters for the current season, and special arrangements have been made with the hotel management for the services of the Ben Bernie Blue Ribbon Malt Orchestra. The Chicago Group does not exact any dues and accords the privilege of membership to all who desire to attend its meetings. Those interested in receiving notices of these meetings are requested to send their names to the secretary of the group, B. W. Lewis, in care of Wishnick-Tumpeer, Inc., 365 E. Illinois St., Chicago.

New York Group

THE New York Group, Rubber Division, A. C. S., will hold its last meeting of the year, its popular Christmas Party, Wednesday, December 14, at 6:30 p.m., in the club rooms of the Building Trade Employers Club, 2 Park Ave., New York, N. Y. The usual entertainment and drawing for prizes will take place.

Two papers will be presented: "Aromatics and the Rubber Industry" by B. T. Bush, of Bushfield, Inc., 39 W. Eighth St., New York; and "Impregnation of Textiles with Latex" by W. J. R. Hauser, of the Revertex Corp. of America, 40 Rector St., New York.

Tickets for the dinner, at $2 each, may be obtained from the Group secretary, Peter P. Pinto, 250 W. 57th St., New York.

New Officers

THE following is the result of the ballot taken by mail showing the officers of the Rubber Division, A. C. S., for the year 1933. L. B. Sebrell was elected chairman; Ira Williams, vice chairman; C. W. Christensen, sergeant-at-arms; H. E. Simmons, secretary-treasurer; and E. R. Bridgwater, E. B. Curtis, L. C. Peterson, A. F. Pond, and F. W. Stavely, members of the executive committee.

Coming Meetings

THE American Chemical Society will hold its 85th meeting in Washington, D. C., the week of March 26, 1933; 86th meeting, Chicago, Ill., the week of September 11, 1933; 87th meeting, St. Petersburg, Fla., March, 1934; 88th meeting Cleveland, O., autumn of 1934; and Fifth National Organic Chemistry Symposium at Cornell University, Ithaca, N. Y., December 28 to 30, 1933.

Triethanolamine

D. B. Mullin[1]

TRIETHANOLAMINE is a synthetic organic chemical which in the last few years has developed from a laboratory curiosity to a commercial product of many and varied industrial applications. In a number of respects it may be said to combine the properties of glycerine and ammonia in a single chemical compound. Like the former, it is a viscous, hygroscopic liquid of high boiling point and of ready solubility in water. It is also an organic base so that, like ammonia, it combines with acids.

Triethanolamine is of interest to rubber chemists for the following reasons:

It has been suggested in place of ammonia to hold latex in suspension while being transported in tank steamers to this country, since its very low vapor pressure would prevent its escaping and subsequent replenishment as would be the case with ammonia.

In addition to the above stabilizing effect, it imparts valuable properties to the latex by its ability to increase penetration due to its property of lowering surface tension. Its softening effect on latex films is also of interest.

The soaps of triethanolamine are being tried as wetting-out agents for fillers such as zinc oxide, clay, and particularly carbon blacks, as well as a means of suspending such materials in colloid mill dispersions.

Since this amine is but mildly alkaline, being approximately 1/6 the alkalinity of ammonia, it finds application in place of hexamethylene tetramine as an activator for accelerators, for it readily combines with the hydrochloride formed in curing and gives a faster and better cure.

A mixture of roughly equal parts by weight of triethanolamine and sodium bicarbonate used in place of the ordinary accelerator in sponge rubber manufacture produces a very fine product of good resiliency; but it can be used in only comparatively thin sheets, for the cure is so fast that thicker sheets are not expanded.

Triethanolamine may be used in place of usual accelerators for making rubber heels, soles, etc. Approximately 1% of the amine is added to the mix and permits a decrease of ½ in the usual milling time; while the resulting molded product is more easily removed from the mold than is otherwise possible.

[1]Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y.

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Caoutchoucine [1]

THE rectified volatile product obtained by the dry distillation of crude rubber was designated "Caoutchoucine" by William H. Barnard who patented it in August, 1833. His process was as follows:

Crude rubber as imported was cut into small lumps, placed in a cast-iron still, and heated. As the temperature rose, a dark colored oil was distilled over. When the thermometer registered 600° F., nothing remained in the still except dirt and charcoal.

The distilled liquid was subjected to the ordinary process of rectification resulting in fluids of varying specific gravities, the lightest being not under 0.670. At each rectification the color of the liquid became brighter and more transparent until at 0.680 gravity it was colorless and highly volatile.

Caoutchoucine is a solvent for caoutchouc, resins, and oleaginous substances. When mixed with alcohol, it will dissolve copal resin at ordinary atmospheric temperatures.

[1]From *American Farmers' Encyclopaedia*, 1844, published by Carey & Hart, Philadelphia, Pa.

New Machines and Appliances

New Laboratory Mill

A 2-ROLL rubber mill of radically new design for laboratory use is represented in the accompanying illustration. It is the outcome of long experience in the manufacture of mills of this class and embodies certain new advantages and improvements which make it a very compact unit.

The mill is mounted on a pressed steel base within which is housed the motor and brake arrangement. Thus the machine occupies less than half the space previously occupied by the same size mill. Being self-contained, it requires no foundation and can be set on any level floor.

The mill rolls are new in design and are hollow bored, permitting a thin wall resulting in uniform and more rapid heating and cooling. The gear train, mounted in 2 rigid bearings, is new to this class of machinery and permits mounting a self-contained brake that is instantly effective in case of accident to the operator.

These mills are made in 3 standard sizes with rolls 6 by 12, 8 by 12, and 8 by 16 inches. They are fitted with either friction or even speed connecting gears. The motors supplied are of standard make and fitted with push button station and automatic solenoid brake and starter. Stewart Bolling & Co., 5207 Lakeside Ave., Cleveland, O.

Special Rubber Mixer

THE new midget-size Banbury is designed to provide a machine of smaller capacity than existing laboratory models for special experimental work on rubber, asphaltic materials, phenolic condensation products, resinous compounds, paints, lacquers, and other plastic materials.

The illustration shows that the mixer is hardly larger than its motor. It has a capacity of 90 to 150 grams, depending on the specific gravity of the stock. The complete unit, including the motor with integral gear reduction weighs only 350 pounds, packed for shipment. The machine is designed to be mounted on a bench or table of suitable height for convenient operation.

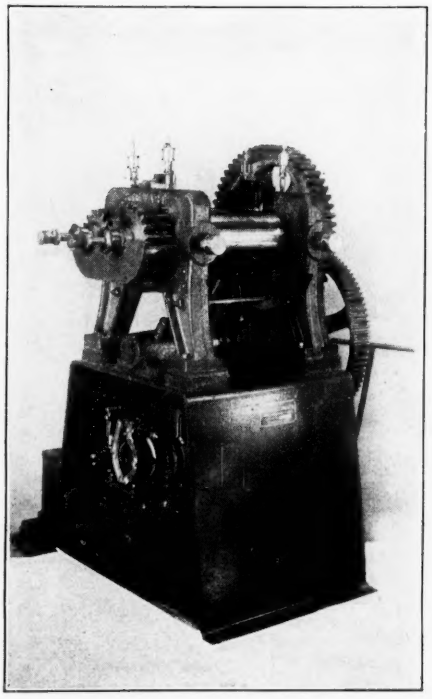
The 2 rotors of the mixer are of the same type as the larger commercial machines. The mixing chamber has only one opening, that being in the top, through which ingredients are charged and the mixed stock discharged by tilting the mixer by the handle attached back of the machine. A floating weight is provided to keep the stock within the sphere of mixing action. Sheeting the stock after mixing is accomplished by a pair of rolls mounted on extensions of the rotor shafts.

The wide range of speeds obtained from the motor makes the machine particularly effective for experimental work. As special features, when required, the mixing chamber can be arranged for vacuum or pressure and for heating and cooling. Farrel-Birmingham Co., Inc., Ansonia, Conn.

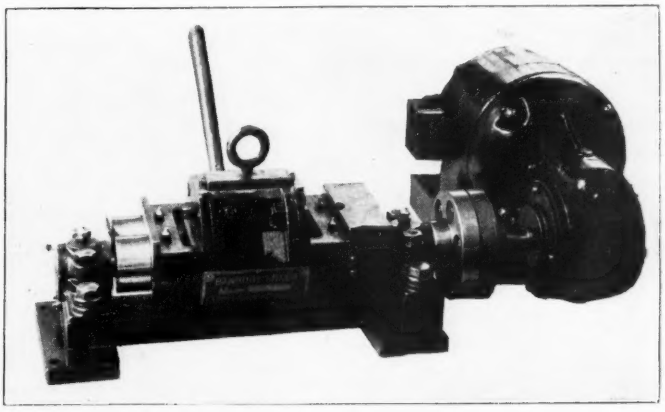
The Tensilgraph

THE hand-operated testing machine here pictured is portable and has a capacity up to 100 pounds. It is only 30 inches in length, weighs less than 20 pounds, and works equally well when used in a horizontal position or when hung on a wall. It is a spring head type machine, incorporating a novel spring feature which yields consistently accurate test results. This construction eliminates the disadvantages in a portable machine built on the dead weight lever principle.

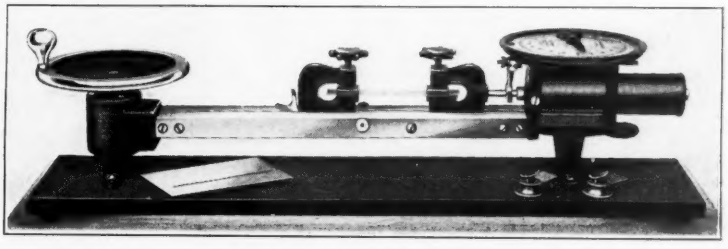
The machine is built to test standard size specimens of fabric, paper, and similar materials in conformity with specifications and practice as recommended by the United States Government and American Society for Testing Materials. The test result is indicated on the dial by a pointer which stays at the breaking point of the sample until manually reset. The operation of this machine is so simple that no experience is necessary to make accurate tests. The time required to test a sample and reset the machine for the next test is a matter of only a few seconds. As a tester for office or factory routine work the machine fulfils every requirement within its capacity. Henry L. Scott Co., Providence, R. I.



Bolling Laboratory Mill

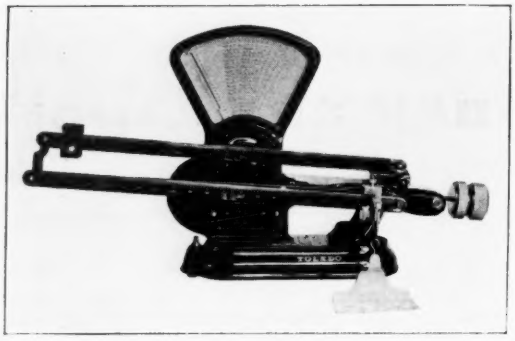


Midget Banbury Mixer



Scott Portable Tensilgraph

Amthor Tachometer



Toledo Variation Auto-Gage

Portable Tachometer

A NEW portable tachometer for testing machine speeds is pictured in the illustration herewith. This instrument features a new automatic fixed reading principle. When applied to a rotating shaft, the pointer on the barrel instantly points to the speed and follows every pick-up or slow-down. When taken away, the pointer does not return to zero; it remains fixed at the last speed reading on the dial.

With this new feature it is no longer necessary to keep the eyes focused on the dial, and the tachometer may be used in the dark or in inaccessible places. It facilitates testing and checking speeds of engines, motors, blowers, centrifugals, shafts, and belts.

The dial reads directly in r.p.m., but all feet per minute surface speeds can be measured. Each of the 4 speed ranges of the tachometer is read over the entire dial, providing actually 4 times the graduation space and, consequently, closer readings. Each has a double-cross pendulum governor movement, is hand calibrated for accuracy, and dead beat in action. Amthor Testing Instrument Co., Inc., 309 Johnson St., Brooklyn, N. Y.

Variation Auto-Gage

IN MANY industries manufacturers have difficulty in measuring changes in the physical characteristics of materials during processing or before shipment and after receipt. The variation auto-gage here pictured has many applications in various fields as it measures and indicates the increase or loss of any physical property in any material. Increases or decreases in elasticity, specific gravity, or moisture are quickly shown. It will determine the percentage of volatiles which can be driven out of materials. It will be of great help in many industries for measuring the elasticity of rubber.

The auto-gage is constructed by mounting 2 beams on the front side of a standard fan type Toledo scale. One beam is graduated from left to right; the other from right to left. A slidable member is placed on each beam. One of these members carries knife edges on which is mounted the container. The weight of one slidable member equals the weight of the other together with its knife edges and container. With no load on the container, the indicator of this scale will be in the no-load position whenever the 2 slidable members are set on corresponding graduations on their beams. This provides a device that makes it possible to adjust the weights from 2 ounces to 50 ounces to bring the indicator to its full capacity position. One row of graduations on the chart runs from zero to 480 and is used to indicate the correct setting of the slidable members.

American Studio

Electro-Lens Counting Glass

The sample to be tested having been balanced and weighed before drying, its percentage loss of moisture is determined as follows: The slidable members on the scale beams are placed on the graduations noted for the undried sample and the sample again placed in the container. The operator then reads the percentage of moisture in the circle of graduations noted on the sample; no mental calculation is necessary. In the case of any industry special charts are furnished to fit the work. Toledo Precision Devices, Inc., Toledo, O.

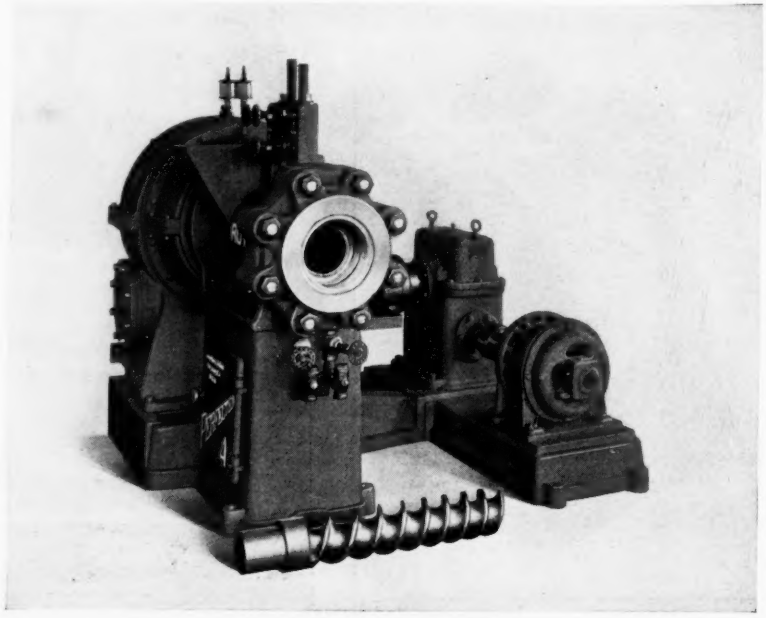
Illuminated Fabric Counter

THE electrically lighted textile counting glass is a most convenient portable tool for laboratory and inspection departments in rubber plants. It is the ideal counting and inspection glass for fabrics. A flashlight slide switch unit serves as a handle and throws a bright clear illumination on the work. The lens has automatic focus and 5 power magnification. The instrument is equipped with a removable counting plate for counting textiles on all dimensions from ⅛- to 1 inch. With the counting plate removed there is an unobstructed field of vision 2 inches in diameter. Electro-Lens Sales Co., 40 Worth St., New York, N. Y.

Special Tubing Machine

THE worm drive tubing machine pictured in the accompanying illustration is a standard machine changed over to handle a special compound requiring a very low stock screw speed. This is accomplished by a double worm reduction or by using a geared motor triple reduction. An extra large hopper and reverse direction rotation of the stock screw is also accomplished. Machines of this type have been furnished with bronze and other special cylinder liners to meet chemical requirements.

While this is not a standard machine, it indicates what can be done mechanically to meet the particular requirements of certain industries. This service is available to manufacturers confronted by changing market conditions, new chemical discoveries, and consumer demand. John Royle & Sons, Paterson, N. J.



Royle Specially Adapted Tuber

New Goods and Specialties

Improved Nipple

THE Davol Rubber Co., Providence, R. I., now offers a new type of Anti-Colic brand Sani-Tab nipples and nursing bottle caps. The new merchandising package consists of 5 nipples and a bottle cap in a glass jar, which is metal capped for use in the home as a container for sterilized nipples.

Rubber as Beauty Aid

WOMEN will welcome this inexpensive, convenient, and sanitary aid to beauty, a set known as the Paradown Facial Patter and Powder Puff, fashioned entirely of rubber. The soft rubber patter is extremely beneficial to the skin, for it builds up the tissues, prevents enlarged pores, and leaves the face clean and refreshed. Creams and astringents are applied with the finger tips. Then the face is patted with the patter, using the side that has the concentric ridges for creams, and the smooth surfaced side for astringents.

The powder puff, of sponge rubber, can be washed with plain soap and water. After the soap is rinsed out, the puff is squeezed between a Turkish towel and will dry very quickly. Daily washing is recommended for any puff, and this one is said to become cleaner and fluffier with every washing. It will always be downy soft on the face and is claimed not to injure even the tenderest skin.

The set comes in red, green, and yellow. The powder puffs, however, are all white on one side. Mar-Ney Products Co., 4541 Washington Blvd., Chicago, Ill.

Rubber Traffic Markers

THE superiority of rubber over other materials for traffic markers and signals has long been recognized. One manufacturer, however, has employed orange rubber for this purpose because that color under all conditions predominates in visibility.

These orange markers and signs are made in 4 styles. The Highway Surface Type consists of a thick, tough rubber cover vulcanized under heat and pressure, around a circular forged steel insert to which is attached a forged screw anchor. The marker comes in the following sizes: 3½, 5, and 10 inches.

The Highway Inlaid Type comprises a heavy pressed steel tray into which is vulcanized under heat and pressure a rectangular rubber traffic marker with a ⅛-inch orange crown projecting above the pavement surface. This marker is said to be not only safe from snow ploughs, but protects the pavement from fracture after installation. It is made in sizes 5 by 10

No. 151
"Sani-Tab"
Patented

Amber
Rubber Nipple

inches and 5 by 20 inches as well as a 5-inch circular with a ⅛-inch crown.

Two models of rubber traffic signs are available. One, known as the Highflex, is upright, bearing the word STOP in

Trumco Non-Slip Trouser Support

orange. The base, reenforced with steel, is securely fastened to the pavement. As the upright part of the sign is of resilient rubber, it immediately springs back to its original position in case a car runs over it.

Highflex Rubber Traffic Sign

Highway Inlaid Rubber Traffic Signs bearing the warnings STOP or SLOW are fashioned of tough resilient orange and black rubber vulcanized to steel and firmly anchored into the pavement base by special steel bolts. The letters of these signs are of special design elongated to increase their visibility, which is further enhanced by a special sloping crown. The size of the sign is 13 by 36 inches. Highway Marker Co., Inc., 2323 Wolfram St., Chicago, Ill., distributes these markers, which are made for it by The B. F. Goodrich Co., Akron, O.

Rubber Ball with Valve

Rubber Trouser Support

FROM the Midwest comes a novel product that has won much favor there. It is a trouser support in which rubber plays an important part. The Trumco Non-Slip Trouser Support, as it is known, consists of a piece of cloth about 8 inches long and somewhat triangular in shape to which is sewed a similarly shaped, but smaller, piece of sponge rubber with 3 holes for ventilation. A button-hole and 3 pins are provided for fastening each support, which is packed 2 in a box.

To put them on button them on the suspender buttons inside of the trousers at the hip on each side so that the cloth side is next to the trousers and the rubber is next to the shirt. Pin the cloth ends to the lining of the trousers. The rubber may appear a little stiff at first, but it will soften after a few days' wear.

These supports prevent, so it is said, the trousers from slipping down and the shirt from working up. They enable the wearer to wear his belt looser and thus be more comfortable. Trumbull Manufacturing Co., 5415 Wayne Ave., Kansas City, Mo.

Improved "Gam-Bal"

FOR a wide variety of sports for youngsters—and even grownups—including hand ball, hand baseball, catch, dodge ball, soccer, volley ball, basketball, exercises, and water sports, is offered Webb's "Gam-Bal." It is especially constructed for physical educational work in elementary schools and kindergartens, public recreation centers and camps, etc.

Made of best grade auto tire stock, it is air filled and guaranteed against deflation in stock for 9 months. This ball presents a standard brown leather effect. It is known as "the ball with a true bounce." This true uniform bounce is assured by an equal thickness of rubber throughout. The ball is said to retain its uniform liveliness throughout its life. "Gam-Bal" is so vulcanized that it can never split at the seam and is permanently inflated. It is claimed also that "Gam-Bal" is impervious to dampness under any condition.

Five standard sizes are available: 5, 7, 8½, 10, and 12½ inches in diameter. The 3 large sizes are equipped with Schrader valves. C. B. Webb Co., 200 Fifth Ave., New York, N. Y., is sole distributer.

Rubber Industry in America

OHIO

Goodrich Notes

Engineers of The B. F. Goodrich Co., Akron, have designed low pressure non-skid pneumatic tires for wheelbarrows.

Alexander Dietzius, development engineer and manager of the Polish Potash Works at Lwow, Poland, visited the Goodrich company last month, conferring with officials on latest developments in rubber technology.

R. M. Moody, for more than 2 years at Yokohama, Japan, as production engineer of the Yokohama Rubber Co., Ltd., Japanese subsidiary of the Goodrich company, returned to Goodrich's Akron offices. D. W. Johnson went to Yokohama several months ago to take Mr. Moody's place there.

C. B. Raymond, Goodrich director and former Akron resident who makes his home in Santa Barbara, Cal., was a Goodrich visitor November 10.

General Tire & Rubber Co., Akron, reported that when Mario Bianchi, speedy Italian race driver, drove on Washington race tracks the first racer ever equipped with General streamline Jumbo tires, he won every event which he entered, because, as he said, his car made big gains on the straight-aways and developed no shimmy even at 90 miles an hour.

Master Tire & Rubber Corp., Akron, according to W. P. Cline, vice president and treasurer, purchased the Quaker City Rubber Co., Philadelphia, Pa. The consolidation was effected to augment Quaker City management with that of the Master corporation. Total assets of the Master corporation now exceed $5,000,000; annual sales are over $6,000,000; and employes total over 1,200. No change is contemplated in executive personnel of the Quaker City company. F. C. Millhoff, Master vice president, said that such varied mechanical goods as hose, belting, gaskets, stair treads, and matting will give the Master corporation a more diversified line and place the company on a more competitive basis with other manufacturers. Mr. Millhoff is familiar with the market of rubber mechanical goods through his former connections. Merging the Quaker City company brings the total companies of the Master corporation to 4: Falls Rubber Co., Akron and Cuyahoga Falls; the Cooper Corp., and Giant Tire & Rubber Co., both of Findlay. Other Master officers are: I. J. Cooper, chairman of the board; R. P. Bremer, president; J. F. Schaefer, secretary; and F. M. Shadley, comptroller.

New Superintendent of California Goodyear

William Harold Fleming, the new superintendent of the Los Angeles, Calif., factory of The Goodyear Tire & Rubber Co., Akron, O., has been with the company since 1912 as efficiency man, division superintendent of tires, manager of material control, division superintendent of Dept. 101, and superintendent of production at Plant No. 2.

He was born on February 4, 1891, at Paintvalley, O. Mr. Fleming is a graduate of Akron U. and M. I. T. He belongs to Delta Tau, Lone Star, Theta Tau, Exchange Club, and American Chemical Society.

He took up his new duties early last month and has moved to California.

Binney & Smith Co., through Enos H. Baker has announced the removal of its Akron office from 515 United Bldg. to 204 Ohio Bldg.

Morris E. Mason, for many years executive of the Mohawk Rubber Co., who died recently, left his widow an estate appraised at $22,119.

Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y., has appointed E. J. von der Heide as sales representative to handle Farrel-Sykes gears, gear units, and gear generators in the Midwest, with headquarters at 824 Miami Savings Bldg., Dayton.

The Patterson Foundry & Machine Co., E. Liverpool, will enter the heating field about the first of the year with a complete line of conditioned air heating systems, air conditioners, oil burners, domestic stokers, and gas fired equipment for all types and sizes of heating loads.

The Colonial Insulator Co., 973 Grant St., Akron, makes porcelain forms for manufacturers of dipped rubber goods. Executives include J. R. Hemphill, president; A. B. Sheets, vice president; R. W. Hemphill, secretary; W. H. Motz, treasurer; and A. J. Hershey, purchasing agent.

Advance Rubber Co., 1796 E. Market St., Akron, through President F. R. Jefferys reports that since starting operations in mid-August it has equipped its factory for the production of storage battery parts such as hard rubber covers, vent caps, and soft rubber gaskets and bushings, in which products the firm intends to specialize. Increased sales have warranted the factory operating on a full-time basis for over a month, and orders on hand indicate that this schedule may be continued for some time.

MIDWEST

National Safety Council

The first annual safety contest of the Rubber Section, National Safety Council, Civic Opera Bldg., Chicago, Ill., was very satisfactory. Twenty-five units registered, and the contest was participated in by 20,907 persons who worked 20,660,197 man-hours, for an average frequency rate for the contest of 5.760. Thirteen units completed the contest with a frequency rate below the average; 3 of the units made perfect no-accident records. The winner in the Tire Division was the U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y., with no lost-time injuries, the employes working 159,429 man-hours. The winner in the Mechanical Goods Division was the United States Rubber Co. (Development Department), Passaic, N. J., with no lost-time injuries, the employes working 83,400 man-hours.

Pennsylvania Rubber Co., Jeannette, Pa., reports no lost-time accidents for September.

B. F. Gerpheide, The Goodyear Tire & Rubber Co., Akron, O., is *News-Letter* editor of the Rubber Section, N. S. C.

Monsanto Chemical Works, St. Louis, Mo., and its domestic subsidiaries have adopted the 5-day week according to President Edgar M. Queeny.

Flexo Supply Co., 4459 Manchester Ave., St. Louis, Mo., manufactures flexible or swing pipe joints under the trade names Flexo and Durbin. M. M. Stone is president; and M. F. Veatch, vice president and secretary.

Van Cleef Bros., Chicago, Ill., from December 10 to 15 will hold its annual conference of sales executives and field men, who will discuss sales policies and products as affected by current conditions. The company is holding a "Whirlwind" sales campaign for its jobbers' salesmen from October 31 to December 10. Over 300 jobbers have enrolled, and 2,500 jobbers' salesmen are participating. The prizes are raincoats made from Van Cleef's Vanitex rubberized fabrics.

The Falk Corp., Milwaukee, Wis., has appointed G. J. Sturmfelsz as representative in the Baltimore, Md., district, with offices at 1620 E. 32nd St., and H. Douglas Stier in the Atlanta, Ga., territory with offices at 101 Marietta St. The Falk Corp., which manufactures machinery, recently announced its newest product, the line of Motoreducers, which provide a straight line drive and allow a compact combination of both reducer and motor in a single mounting.

EASTERN AND SOUTHERN

A.S.M.E. Annual Meeting

Two leaders of American industry are scheduled for the annual meeting of the American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y., to be held December 5 to 9. General James G. Harbord, chairman of the board, Radio Corp. of America, is to be the speaker at the banquet at the Hotel Astor, December 7. A. W. Robertson, chairman of the board of directors of the Westinghouse Electric & Manufacturing Co., and chairman by appointment by President Hoover of the newly established Committee on Rehabilitation of Industry, will present the Towne Lecture on the relation of economics and engineering. This lecture, to be given at 4:30 p.m. in the auditorium of the Engineering Societies Building on December 8, will be one of the main features of the meeting.

Pneumatic Tired Rail Car

In behalf of the Reading Railway, Charles H. Ewing, president, in the presence of a large group of notables of the business world, at the Reading Terminal in Philadelphia, Pa., on October 28, accepted from Edward G. Budd, president of the Edward G. Budd Mfg. Co. of Philadelphia and Detroit, Mich., delivery of the first pneumatic-tired railway coach ever built for an American railroad.

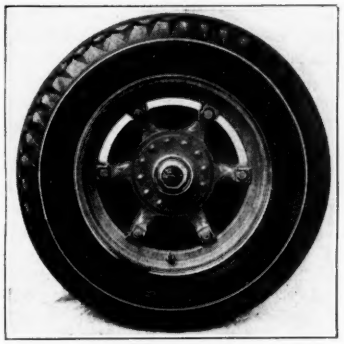
Mr. Ewing stated in his brief speech on the occasion, "This new type of car seems destined to make radical changes in the nation's railroad passenger transportation situation."

This car, designated as "Reading 65," was designed for special suburban service. It has the adaptability of a trolley car and yet a performance suitable to main line operation. Double-end operation, one-man control, Diesel-electric drive, and great strength with light weight, all make for an unusually low cost of operation. With a capacity of 47 passengers, the operating expense is covered by a load of 6 passengers at 3¢ per mile. All of this has been realized in a vehicle offering exceptional traveling comfort.

The operating cost of this car is about 12¢ per mile, including interest on the investment, depreciation, all maintenance costs and replacements, fuel oil and lubrication, but not including crew. In the operation of a similar car over a period of one month in regular service, 2,181 passengers were carried 2,150 miles at a total lubricating and fuel cost of $24.96.

The car wheels are of Budd design to accommodate the Michelin-Goodyear rail car tire. Interest centers about these tires, as they contribute so largely to the comfort and quietness of the car.

The illustration shows the cross-section of the wheel and flange and the inserted aluminum safety ring which supports the wheel in case of deflation of the tire by blow-out. The car is carried on 12 tires, each built to withstand 2,400 pounds.



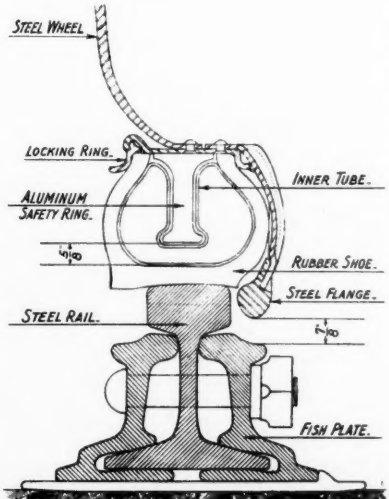
Air Balloon Wheel

Replacement Wheels

THE introduction of doughnut-type tires for passenger automobiles has necessitated the development of a special replacement wheel. Such a wheel, as pictured in the accompanying illustration, makes doughnut tires usable with demountable rims and is applicable to a large number of cars where demountable wheels cannot be used.

These air balloon wheels, as they are called, are demountable at the hub and are available in 7.50-15 and 6.50-16 inch sizes for practically all popular cars. Four wheels and 5 rims and necessary demountable parts constitute a set. Hoopes, Bro. & Darlington, Inc., West Chester, Pa.

The United States Rubber Co., New York, and the **Dunlop Tire & Rubber Corp.**, Buffalo, both in N. Y., are forming the Dunlop-Revere Thread Co. to handle the interests of both concerns in rubber and latex thread throughout Europe. The new company will not engage in the manufacture of fabrics or completed articles.



Cross-section of Wheel, Tire, and Flange

Unemployment Relief

The Committee on Unemployment and Relief for Chemists and Chemical Engineers, 300 Madison Ave., New York, N. Y., Frank G. Breyer, executive chairman, has addressed an appeal for contributions to its relief fund for the approaching winter.

Since last January the committee has helped to secure permanent or temporary jobs for 184 men and women. Of the registrants with the committee are about 500 cases of total unemployment with only small resources behind them. It is estimated that from November 1 to July 1 between $50,000 and $60,000 will be needed to help an average of 100 men and women and their families. It is thought that $32,000 of this sum can be raised directly from the profession, and the balance may be contributed by the chemical industry which is based upon the profession. Contributions should be made payable to Robert T. Baldwin, treasurer of the committee.

N. T. D. A. Convention

Addresses by W. O'Neil, president of the General Tire & Rubber Co., and F. A. Seiberling, president of the Seiberling Rubber Co., both of Akron, O., were outstanding features of the thirteenth annual convention of the National Tire Dealers Association held at Atlanta, Ga., November 14-15-16. Both manufacturers deprecated merchandising practices in the tire industry. Mr. Seiberling emphasized the competition offered by manufacturers to their dealers through the sale of mail order tires, gas station tires, and the operation of company-owned stations. Mr. O'Neil stressed what he believed to be the poor policy of some manufacturers featuring secondary and third quality tires and prices against first line merchandise and profit-producing prices.

The convention was attended by dealers from all parts of the country, but not in the large numbers that marked previous gatherings of the N. T. D. A. The dealers went on record as opposing many practices of the industry and adopted a set of resolutions calling for a change so that dealers would be in a better position to operate profitably. The objections were chiefly centered against the sale of standard brand truck tires through gas stations, the publication of the preferred wholesale price list, and the equipment of new cars by car manufacturers with fourth and fifth spare tires.

Martin J. Barry, Baltimore, Md., was reelected president for the third time. The balance of the officers were also reelected, but 4 new directors were selected to replace men whose terms expired.

Templar Oil Products Co., Inc., 129-51st St., Brooklyn, N. Y., through Secretary F. E. Larkin announces that among its products for the roofing and floor covering trades will be found Topco rubber tile cement for installing rubber tile flooring.

W. J. R. Hauser, of the Revertex Corp. of America, 40 Rector St., New York, N. Y., spoke on "New Developments in the Rubberizing of Fabrics" at the meeting of the New York Section of the American Association of Textile Chemists and Colorists held on November 18 at the Chemists' Club, 52 E. 41st St., New York.

International Pulp Co., with factory at Hallesboro and principal office at 41 Park Row, New York, both in N. Y., manufactures "Asbestine," talc, and talc fiber. Michael Doyle is president; Wm. C. Geer, vice president; S. J. McCrimlisk, secretary and purchasing agent; and W. H. Stillhamer, treasurer.

Martin Rubber Co., Inc., Long Island City, N. Y., through President Walter L. Tepper announces that its new line of stamp rubber has been well received; consequently the Martin company has been very busy the past few months in meeting the demand not only for this new product but also for stamp sponge. Both the stamp and the sponge rubber are made in grey, white, and red.

Aldan Rubber Co., with factory at Tioga and Salmon Sts. and principal office at 1017 Wood St., both in Philadelphia, Pa., manufactures rubber coated fabrics. The company maintains branches at 111 Fifth Ave., New York, N. Y., and 327 S. La Salle St., Chicago, Ill., and an export branch at 2 Stone St., New York. Aldan officers include H. M. Dannenbaum, president; J. L. Krauss, vice president; and A. K. Dannenbaum, secretary-treasurer and purchasing agent.

The Tenth National Exposition of Power and Mechanical Engineering, to be held in Grand Central Palace, New York, N. Y., December 5 to 10, will offer an excellent opportunity for engineers to keep up to date as to the many new things and improvements in the field of power and mechanical equipment. As a duty to themselves they should make every effort to attend. Several important points of contact are possible.

J. H. Lane & Co., with principal office at 250 W. 57th St., New York, N. Y., and branch at 323 S. Franklin St., Chicago, Ill., is mill agent for cord tire fabrics and yarns, clean osnaburgs, chafer, breaker, and filter fabrics, enameling ducks, sheetings, drills, and a general line of fabrics used by the rubber trade. F. H. Babcock is president; William E. Baxter, vice president; S. H. Johnson, treasurer; and C. B. Finckel, textile expert.

Pennsylvania Rubber Co., Jeannette, Pa., recently was visited by 200 members of the Pittsburgh Chapter of the American Institute of Banking. Welcomed by President W. O. Rutherford and Treasurer C. G. Morrill, they were then conducted through the factory by A. C. Bowers, in charge of production. Mr. Rutherford is chairman of an organization for emergency relief of the unemployed in the Jeannette district.

NEW JERSEY

Manufacturers of mechanical rubber goods in New Jersey report improved business during the past month, an indication that this business will remain active during the early winter. No change occurred in the hard rubber situation. Concerns making bathing goods report that activity has ceased until next spring. Production of shoes and rubbers has taken a big jump; so factories are operating overtime.

United States Rubber Co.'s building on Commerce Square, New Brunswick, has been leased to the Seaboard Fabric Corp.

The Thermoid Company, Trenton, states that business continues good at its plant and also at the factory of the Woven Steel Hose & Rubber Co., its subsidiary.

Fierce-Roberts Rubber Co., Trenton, finds business increased since the past month and that conditions for the future seem bright. The company continues with a night shift in the press department.

Wm. R. Thropp & Sons Co., E. State St., Trenton, manufactures for the rubber industry the following machines: calenders, washers, refiners, crackers, mills, drives, cutters, lathes, presses, vulcanizers, and hose machines. John Exton Thropp is president; Mrs. Wm. R. Thropp, vice president; and Joseph W. Thropp, secretary-treasurer and purchasing agent.

The Wiss Cutting Co., 22 W. Fourth St., New York, N. Y., specializes in fabric slitting and roll winding. I. M. Wexler is manager.

The Kelly-Springfield Tire Co., Cumberland, Md., in a suit against The Goodyear Tire & Rubber Co., Akron, O., recently lost its appeal to the United States Supreme Court from New York court decisions denying recovery of damages claimed as the licensee of the Overman Tire Co.'s patent.

Cambridge Instrument Co., Inc., 3732 Grand Central Terminal, New York, N. Y., manufactures mechanical and electrical instruments of precision. The factory is at Ossining, N. Y., and the branch at 425 S. Honore St., Chicago, Ill. Company officers are R. H. Kruse, president; H. N. Packard, vice president and treasurer; W. H. Jefferson, secretary; and L. Birdsall, purchasing agent.

New York Insulated Wire Co., Division of Essex Wire Corp., 420 Lexington Ave., New York, N. Y., has announced the appointment of D. S. Davis as vice president and general manager. Mr. Davis, who has been in the insulated wire industry since 1902, to accept this new post resigned as secretary-treasurer of the Davis-Jones Insulated Wire Co., Pawtucket, R. I., which he had organized in 1922 with George T. Jones.

Rubber Manufacturers Association of New Jersey will hold its annual meeting and dinner this month at the Trenton Club, Trenton, for the annual election of officers. President John A. Lambert will preside.

"Chemicals and Rubber Night" was celebrated recently at the Trenton Carteret Club. Several rubber and chemical manufacturers gave talks on the trade. Fred V. Bechtel, formerly of the Murray Rubber Co., Trenton, headed the committee in charge.

Essex Rubber Co., Trenton, reports that business continues to improve with a better winter outlook.

Puritan Rubber Co., Trenton, announces that orders have been increased for rubber tiling and that general conditions are better.

Quartermaster General C. Edward Murray, president of the Crescent Insulated Wire & Cable and formerly head of the Empire Tire & Rubber Co., both of Trenton, announces that he may resign the office of quartermaster of New Jersey, which he has held for 27 years.

Raybestos-Manhattan, Inc., Passaic, according to Assistant Treasurer W. H. Dunn, during the 9 months ended September 30, 1932, incurred a net loss of $185,810.68, after all charges including $415,278.16 for depreciation.

Murray Rubber Co., Trenton, announces that business has improved under its annual advertising campaign. The company is featuring large cardboard display ads of its tires and tubes for the holiday season. Murray recently suffered a loss from flood when Assunpink Creek adjoining the plant entered the lower floor of the factory and damaged some stock. Officials were partially prepared and had blocks and falls to lift heavy motors and other equipment. The plant was closed for a day to clean up. The flood affected the tire department, mill room, preparatory production department, and shipping.

Pocono Rubber Cloth Co., Trenton, is experiencing continued good business with increased orders for rubber cloth.

Milton H. Martindell, vice president and treasurer of the Joseph Stokes Rubber Co., Trenton, has been on a business trip to the company's plant at Welland, Ont., Canada. He reports business as improving at both concerns.

Lambertville Rubber Co., Lambertville, has been operating with a day and night shift to fill orders for boots and shoes for the holiday trade. The concern has its entire force at work and is gratified with the outlook.

Whitehead Bros. Rubber Co., Trenton, operating normally, reports that business shows improvement.

Harvey S. Firestone, Sr., Akron, O., rubber manufacturer, recently visited Firestone tire dealers in Trenton and vicinity, and saw his son at Princeton University and former Governor Edward Casper Stokes at Trenton.

NEW ENGLAND

Jenkins Bros., Inc., manufacturer of valves and mechanical rubber specialties, is moving its mechanical rubber division from Elizabeth, N. J., to its main plant in Bridgeport, Conn. This move will increase the working force there by 100. The company reports steadily increasing business in mechanical rubber specialties.

The Industrial Rubber Co., 179 Lincoln St., Boston, Mass., opened under the direction of Charles G. Eichenberger.

The Fisk Rubber Co., Chicopee Falls, Mass., starting December 1 will manufacture bicycle tires. The necessary machinery and equipment will be brought from the plant of the Fisk subsidiary, Federal Rubber Co., Cudahy, Wis. The company expects to have a daily production of 2,000 tires by January 1. Reports indicate that the Fisk plant will shut down for 2 weeks next month.

Frank E. Randall, 248 Ash St., Waltham, Mass., manufactures rubber thickness gages.

Gould Golf Ball Co., 429 Washington St., Lynn, Mass., has purchased the Hi-Grade Golf Ball Co., Salem, Mass., and consolidated it in its business. The Gould company, a partnership between Harold I. Gould and M. Joseph Durkin, was incorporated on November 14 under the laws of Massachusetts, as the Gould Golf Ball Co., Inc. Mr. Gould is president; Mr. Durkin, vice president; and Clarence C. Bartlett, treasurer.

Heveatex Corp., dealing in normal, concentrated, processed, and standardized latex, has moved to 78 Goodyear Ave., Melrose, Mass.

The West Co., 130 Library St., Chelsea, Mass., has purchased from H. T. West Co. all its formulas, contracts, machinery, equipment, etc., for manufacturing and compounding rosin oils and pitches. The West Co. recently was incorporated under the laws of Massachusetts. H. T. West is president; and Wm. Soherr, secretary-treasurer.

Dense Dustless Black[1]

A NEW form of compressed carbon black under the temporary designation of Dense Dustless Black is now on the market. The novelty of this material is its state of agglomeration, which results in actual dustlessness. The black itself is produced in the customary way, no change being made until after the black has entered the packing house and the grit has been separated from it.

The procedure from this point on is altogether changed. By purely mechanical treatment, and without adding any other material to the black, the apparent density is increased from 4 pounds per cubic foot to approximately 30 pounds per cubic foot, and all of the fine flocculent particles are compacted together into small spheres, free from dust.

With the discovery in 1915 of the value of carbon black to rubber manufacturers its dustiness became a major problem. It was soon discovered that, although a density higher than 15 pounds per cubic foot impeded the dispersion of black in the comparatively low viscosity oils used in ink and varnish, the high viscosity of rubber and the tremendous shearing action of a rubber mill permitted a much higher density. This higher density was obtained by compressing or briquetting the black in powerful hydraulic or toggle presses and was first done by the rubber manufacturers themselves.

The new process of condensing carbon black reduces dusting to an insignificant amount. Instead of the customary process of agitating, packing, and compressing, the very light, flocculent product having an apparent density of 4 pounds per cubic foot, is transformed directly into millions of tiny spheres, so compact, uniform, and geometrically perfect that they are not only dustless, but flow almost like water and can be poured into bags as simply as sand or sugar. The resulting package is uniform throughout in density and structure.

[1]Godfrey L. Cabot, Inc., Boston, Mass.

The new compressing process does not impair the rubber properties of the black itself, and the thorough control tests and standards continue unchanged.

The spheres of this dustless black are so firmly agglomerated and compacted that they do not abrade or break down with ordinary handling; consequently shipments arrive at destinations in the same dustless condition as when first packed. These minute balls, however, disintegrate very readily when subjected to shearing forces, as a result of which they disperse readily when milled. Its dustless properties are immediately apparent and there are also indications of other advantages in its use.

The Tire Shop Supply Co. was recently opened at 1452 Center St., Boston, Mass., by Wilfred Fitzgibbons.

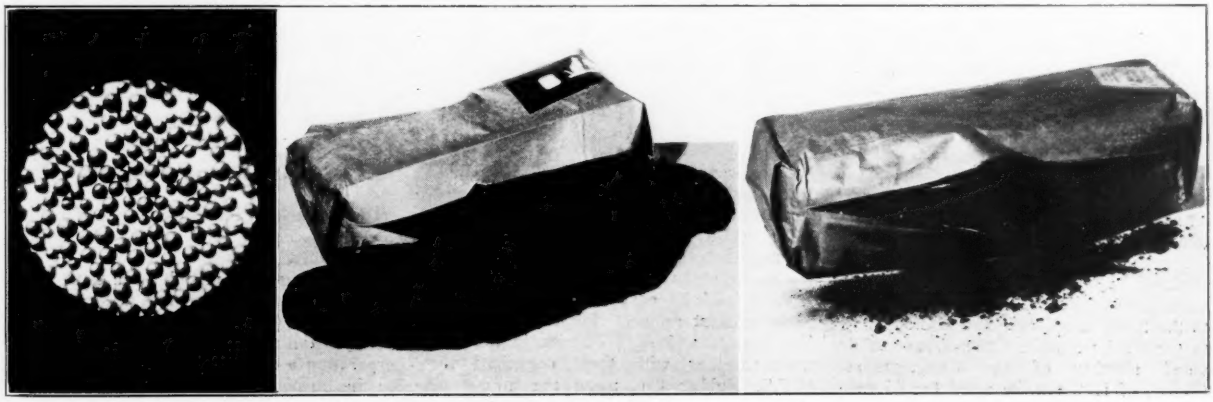
Levi C. Wade, 72 Bennett St., Lynn, Mass., manufactures molds for rubber heels, soles, tiling, and mechanical goods.

The Elm City Rubber Co., manufacturer of rubber specialties, 73 Wallace St., New Haven, Conn., because of increased business has doubled its space, and added new machinery and other equipment to provide 78% additional production.

L. N. Barrett, formerly branch manager for the Willard Storage Battery Co. in Boston has resigned to join the staff of the Massachusetts Tire Sales Co., 1380 Boylston St., Boston, Mass.

The Rubberset Brush Sales Co. opened offices at 89 Broad St., Boston, Mass., managed by John F. Gallagher.

The Firestone Cotton Mills, Fall River, Mass., on a full capacity double-shift schedule, has reopened but this move will not affect operations of the New Bedford plant, which have gradually been increasing and soon will reach approximately 75% of full capacity on a double-shift basis. Both plants are working 2, 6-hour shifts, and present plans contemplate maintenance of that schedule indefinitely.



Dense Dustless Black Magnified 50 Diameters **Dense Dustless Black** **Ordinary Heavy Compressed Black**

OBITUARY

Prominent British Executive

FROM abroad comes the sad news of the death on October 30 of Christian Hamilton Gray, for over 50 years a guiding figure with India-Rubber, Gutta Percha & Telegraph Works Co., Ltd., Silvertown, England. He was born April 1, 1859, at Dalmarnock, Dumbartonshire. He attended University College School and then went to Paris and Spain to study languages.

Upon his return to England he joined the submarine cable-laying department of the Silvertown company, spending some time in Algiers on test work. Then he went to the Persan (French) works of the company. In 1885 he became manager of the rubber departments at Silvertown and eventually took over the proofing, ebonite, and gutta percha sections. For the last 20 years Mr. Gray was managing director, having also served as chairman from January, 1922, to September, 1928. Besides he was a director of Palmer Tyre, Ltd., since it was organized.

He was awarded the Cross of the Chevalier of the Legion of Honor by the President of France for his work during the war on cutting and diverting German cables underseas.

Although he belonged to the Blackheath Golf Club, Mr. Gray's entire life was wholly devoted to the Silvertown business, which flourished under his capable guidance.

Funeral services were held on November 2 at St. Michael's Church, E. Wickham, where a goodly crowd paid their last respects to their departed friend and chief.

Pioneer Webbing Manufacturer

WALDO E. CONANT, webbing manufacturer of Littleton, Mass., died of heart trouble at his home here after an illness of 10 days. Mr. Conant was born in Boxboro, Mass., February 1, 1855, and educated in Boxboro public schools, later attending Lawrence Academy at Groton.

In 1873 he entered business with his brother in the store of Conant & Co., Littleton, Mass., and in 1879 opened a store in Cochituate, Mass., in partnership with Daniel Houghton. In 1882 he began the manufacture of elastic webbing in Littleton, and his company expanded steadily until July, 1914, when it was incorporated as Conant, Houghton & Co., Inc., and employed some 300 men. Mr. Conant was president of the company until it merged with the United Elastic Corp., Easthampton, Mass., in 1927.

For 25 years Mr. Conant served as town clerk of Littleton. He was on the School Committee 6 years. In 1905 he was elected to the State Legislature and was appointed to the Public Service Commission. A devoted member of the Congregational Church of Littleton, he acted for 45 years as its treasurer and 40 years as a deacon. He is survived by his wife, 4 sons, and a daughter.

Veteran Italian Rubber Man

G. B. PIRELLI, founder of the Italian rubber industry, who died on October 20 at Milan, was born at Varenna (Como), December 27, 1848. After having studied mathematics at the University of Pavia during 1865-66, he entered the Engineering School (Polytechnic) of Milan, where he was graduated in 1870.

In the meantime he had fought as volunteer with Garibaldi in the Italo-Austrian war of 1866 and at Mentana in 1867 against the Pontificians.

After graduating he obtained a fellowship for visiting industrial plants abroad. During this trip he decided to start in Italy, where none existed, a rubber industry. Aided by influential friends in 1872 he founded a small company, "Pirelli & C.," and opened a rubber factory, which he personally managed both technically and commercially and which produced practically every kind of rubber article then known.

In 1880 he began making insulated wires and cables, an entirely new industry in Italy. In 1886 he opened at S. Bartolomeo (Spezia) a plant for submarine cables and purchased a cable-laying ship.

The Pirelli company grew both in Italy and abroad through several associated foreign companies, among which are Pirelli, Ltd., London, which operates a tire factory at Burton on Trent, and the Pirelli General, which owns cable plants at Southampton and Eastleigh. Other or associated companies operating factories were organized in Spain, Argentine, Brazil, and France. Rubber estates were also bought and extended both in Malaya and Java.

Mr. Pirelli was prominent in national and local political and administrative life and in 1909 was made Senator of the Kingdom.

Up to the last year he took a very active part in the life of his companies, of which he was the revered chief.

Inventor of the Suction Heel

THE press announced the death, after a brief illness, of John George Tufford, 73, at Elyria, O., on November 23. Mr. Tufford, formerly a shoemaker, came in 1881 from Beamsville, Canada, to Elyria where he established a shop of his own and took charge of the repair department of a shoe store.

In 1913 fie invented the well-known form of rubber heel with inner surface concaved so that suction and the resiliency of the rubber held its edges tightly against the shoe without cement. He interested Carl H. Ingwer and A. G. Smith in his idea and together with them organized the I.T.S. Rubber Co., using the initials of their names as a designation for the organization.

The company began business in 1915 and prospered from the beginning. The I.T.S. Rubber Co. of Canada, Ltd., and the I.T.S. Rubber Co., Ltd. (London), were later formed to manufacture and sell rubber heels. In 1923 the I.T.S. Rubber Co., and the International Patent Heel Co. of Delaware were merged in a new company, the I.T.S. Co. of Ohio, of which Mr. Tufford was also president.

The Tufford heel patents being basic resulted in many infringement suits in which the claims of the original patent were generally sustained by the courts.

Mr. Tufford was well known for his philanthropies. For 12 years he made Los Angeles, Calif., his winter home. He is survived by a son, Leonard.

Former Plant Superintendent

FOLLOWING a 3-week illness, Clarence G. Ames, 80, died at his home in New Haven, Conn., on October 31. For 63 years he had been with the L. Candee Rubber Co., New Haven, and for many years as plant superintendent.

At one time he was on the Board of Fire Commissioners, New Haven, and for more than a half century Mr. Ames belonged to Quinnipiac Lodge, I. O. O. F. He is survived by a son and a daughter.

Noted South American Explorer

ON OCTOBER 27 at his home in Kansas City, Mo., died Dr. Edwin R. Heath, one-time South American explorer. He went to Chile in 1869 as secretary to the American Ministry. While there he engaged in much dangerous exploring. In August, 1880, Dr. Heath, who was topographer and surveyor as well as physician, was the first to explore the Bolivian river Beni to its mouth. Here he found a few men engaged in the rubber industry, but after his discoveries a flourishing industry was developed there. Many honors were conferred upon him for his works.

He was born on July 11, 1839, in Janesville, Wis. He graduated from a New York medical school, but practiced mostly, when not exploring, in Missouri.

Paintless Golf Balls

The whiteness of the paintless golf balls is due to compounding the balata cover stock with a white mineral oxide. The pigment being thus mixed throughout the cover stock confers permanent whiteness on the ball and obviates the need of renewing by painting. While the idea of incorporating a mineral in balata is not new for the purpose intended, the long milling necessary exposes the balata to scorching which injures its quality and induces final crumbling.

Rubber Industry in Europe

GREAT BRITAIN

Gaisman Block Pavings

Engineers, beginning to realize the value of rubber for selected places where absence of vibration and noise is a big asset, are prepared to pay the price even at a time when no assistance is obtainable from the Ministry of Transport, says the *Bulletin of the Rubber Growers' Association.* Consequently when the widening and straightening of Market St. in Huddersfield was undertaken, a section 1,200 square yards in area, to front future new municipal buildings, was laid with the improved Gaisman rubber block by the Universal Paviors, Ltd. The price, £2 10s. per square yard, for the blocks delivered and laid, is the standard price, with the usual free maintenance guarantee for 10 years.

The improved block is of the same construction as the block laid in New Bridge St., London, in 1926, but is smaller and easier to handle. In addition the quality of the tread has been so improved that it is 3 times stronger in resistance to tear.

Paving with the new Gaisman block is also to be undertaken on Lombard St. in consequence of a petition filed and signed by frontagers on this street. The firms involved, including banks, insurance companies, etc., have offered to pay 30s. out of the total cost of £2 10s. per square yard. However, before work is commenced here, the City of London Corp. wishing to study the new block in New Bridge St. under the exceptionally severe conditions, has decided to remove 200 square yards of the original area of 700 square yards of the old rubber paving in the street and to substitute the new block. As the latter is dark grey and the original almost white, the 2 types will be easily distinguished.

I. R. I. Activities

At a meeting of the London section of the Institution of the Rubber Industry on October 10, 1932, Miss Huenemoerder and E. A. Hauser presented a paper on "The Problem of Fabric Impregnation with Rubber." After a restatement of the findings with regard to the incompleteness of fabric impregnation with plain latex, the authors gave some details regarding their latest experiments in this field. They have found that when suitable wetting agents, as Igepon, for instance, were mixed with the latex or if, in special cases, the fabric to be impregnated, was first treated with these wetting agents, excellent and almost instantaneous impregnations could be obtained. A number of slides and actual samples demonstrated the degree of penetration attained by the new method.

The Northern Polytechnic (Holloway, London, N.) has arranged a series of lectures on latex every Wednesday evening beginning October 19. The fee for the course is £1 for the following lectures: October 19, "The Source and General Properties of Rubber Latex," by F. H. Cotton. October 26, "Physico-Chemical Consideration. Latex as a Colloidal System." C. W. Shacklock. November 2, "The Concentration and Compounding of Latex," F. H. Cotton. November 9, "The Use of Latex as a Bonding Agent," W. D. Stevens. November 16, "Latex in Adhesives and Applied to Fabrics," F. H. Cotton. November 23, "The Production of Dipped Goods from Latex," F. H. Cotton. November 30, "Electro-Deposition of Rubber from Latex," F. H. Cotton. December 7, "Vulcanized Latex," P. Schidrowitz. December 14, "Recent Applications, Including Latex Sponge," M. Favier.

A paper, "Airplane Covers and Wheels," by F. Fellowes, was read at a joint meeting of the London and District Section of the I. R. I. and the Royal Aeronautical Society on October 27.

The ninth Annual General Meeting of the London and District Section was held November 14. The program included a paper on "The Use of Rubber in the Printing Industry," G. L. Riddel.

"Latex Round Thread—Its Manufacture and Properties" was the topic treated by E. A. Murphy at the meeting of the Midland Section October 27.

Sir George Beharrell, D. S. O., has accepted nomination as new president of the Institution to succeed Eric Macfadyen, president for the last 3 years.

New Products

Cylindrical plating barrels used in the electro-plating industry, now made of hard rubber, have proved highly successful under most exacting conditions, reports the *Manchester Guardian Commercial.*

If latex is added to finely ground reclaimed crumb before the treated washed crumb is tipped out of the rotary washer drum, writes P. M. Howison to *The India Rubber Journal,* it should combine satisfactorily with the wet reclaimed crumb and then dry as readily as the crumb on the driers. When dry, mill sheeting will assure a uniform, combined stock. The movement of the wet reclaimed crumb in the rotary washer should prevent any wasteful adhesion of the latex to the washer walls.

Hegolit 3, the new rubber softener and dispersing medium, is a preparation of higher aliphatic alcohols, with melting point of 50° C., is neutral and free from rubber poisons. It is said to be valuable in carbon black and lamp black mixings, preventing agglomeration and permitting the use of larger quantities of black than is usually possible. Further, it is claimed to increase resistance to sun-cracking and aging and to reduce the time of cure of mixings containing blacks. In highly accelerated mixes it helps to prevent scorching as it reduces the heat of friction during calendering, etc.

Cortex is a new product comprising cork combined with rubber by a secret process. Many uses and advantages are claimed for it. By adding rubber, compressed cork, which is said to wear better than oak for flooring, but which cannot be dyed, can now be produced in a variety of colors and marbled effects, thus opening a wide field for the material as floor covering. Cortex soling can be stitched, pegged, or cemented. This material in sheets from 1/64-inch thick up is useful for insulation, gaskets, pads, etc., and for covering handles of bats and clubs, etc. Owing to the rubber present, Cortex mats are stiff or flexible and come in various colors. Finally this material can also be used for jar rings.

Bristol in Britain

The Bristol Co., Waterbury, Conn., U. S. A., established on October 1, 1932, a British factory at 144 Pomeroy St., New Cross, London, under the name of Bristol's Instrument Co., Ltd., incorporated under the Companies Act 1929. Howard H. Bristol, president of the American company, is chairman of the board of directors, Alexander L. Dugon, of J. W. & C. J. Phillips, Ltd., Bristol sales agent in England, is vice chairman and managing director.

Although the general expansion program of the Bristol company contemplated the founding of a British plant at some future time, the altered economic and business situation within Great Britain made an earlier establishment for manufacturing in that country seem advisable.

New Duty on Footwear

To assist the development of the British rubber footwear industry on mass production lines, the Treasury announces the imposition of a specific duty in addition to the existing 20% duty, effective as from October 21, 1932. This duty, which will cover boots, bootees, shoes, overshoes, slippers, and sandals of all descriptions, made wholly or partly of rubber, balata, or gutta percha (except where the outer part of the uppers is made entirely of leather or leather and elastic), will amount to 3d. per pair when made to cover the ankles and 2d. per pair in other cases. It is further hinted that if abnormal competition continues, the matter will be reconsidered, probably with a view to increasing protection. Meantime, it may be said that manufacturers do not appear to be very satisfied with the new duty, claiming that it is inadequate against Japan.

GERMANY

Renowned Rubber Chemist

In his life work devoted to the chemistry of rubber, Ernst A. Hauser has to his credit many successful accomplishments, not the least of which is his invention of the Revertex process. Yet not content to rest on the laurels of his past achievements Dr. Hauser, still a young man, is continuing his efforts for the advancement of the rubber industry.

He was born on July 20, 1896, in Vienna, Austria. He attended the Akademisches Gymnasium, Vienna, University of Vienna, and University of Göttingen, receiving his Ph.D. in Vienna on March 21, 1921.

This brilliant scientist began his career as assistant in the chemical laboratory of the University of Vienna (1919 to 1920). The next year he served as assistant in the Department of Physics, University of Göttingen. From 1922 to 1925 he was in charge of the research department, Rohstoff-Trocknungs Ges., Frankfurt a. M., Germany, a subsidiary of the Metallgesellschaft A. G., and since then has been head of the colloid chemical laboratory, Metallgesellschaft A. G., also in Frankfurt.

When this eminent chemist was made a fellow of the Institution of the Rubber Industry, London, England, October 13, 1926, he was the first non-English-speaking foreigner to be so honored. The coveted plaque "For Exceptional Services" in the rubber industry, awarded by the Deutsche Kautschuk Gesellschaft (German Rubber Society), of which he now is president, was won by Dr. Hauser in 1931. He was the first Gow lecturer at University College, London, for 1927 and since February 1, 1928, has been a non-resident associate professor of colloid chemistry at Massachusetts Institute of Technology, Cambridge, Mass., U. S. A., where he lectured on colloid chemistry. Furthermore he acts as overseas correspondent to the Association of British Rubber Manufacturers and as contributing editor to *Journal of Rheology*. He has traveled extensively, to America, to Malaya, in pursuit of, and, of course, disseminating knowledge in his chosen field.

Ernst Hauser has been president of the Society of German Rubber Chemists and Engineers since 1930. He belongs to the American Chemical Society and its Rubber Division, Society of Rheology, Institution of the Rubber Industry, German Rubber Society, Deutsche Chemische Ges., Kolloid Ges., etc.

The literature of rubber chemistry in all its phases has been enriched by his many contributions to various periodicals. He has written, too, several books including "Latex," which may be had in German and English editions, and "Colloid Chemistry of the Rubber Industry." He has contributed several chapters to the "Encyclopädie du Caoutchouc" and has written the chapters dealing with rubber for "Liesegang's Kolloichemische Technologie" and for "Ullmann's Encyclopädie der Technischen Chemie." Dr. Hauser even now is working on 2 more volumes on rubber, one of them being a standard textbook on rubber technology to be edited shortly with the collaboration of an international selection of outstanding rubber technologists.

Ernst A. Hauser

He may be reached at Leerbachstrasse 18, or at Metallgesellschaft A. G., both in Frankfurt a. M., Germany.

Cheap Rubber Goods

One of the largest German rubber factories produces special hot water bottles for department stores and so-called "Einheitspreisgeschäfte" (literally, uniform price stores corresponding to Woolworth, Kresge, etc., in America) to retail at 1 mark each. At these stores, too, garden hose sells at 0.50 mark per meter and bicycle casings at 1 mark each. (U. S. equivalent of 1 mark is $0.2382.)

At the same time press reports stated that Germany's largest rubber manufacturing concern, the Continental Gummi-Werke A.G., Hannover, decided to discontinue manufacturing raincoats as of October 1, 1932, since they had ceased to be profitable. According to last reports, 100 employes were in the raincoat section of the Excelsior factory in Hannover-Limmer; fortunately it was possible to place most of them in other departments.

In reading these 2 apparently unrelated paragraphs, the question intrudes whether they do not in reality represent cause and effect in the rubber industry in Germany—the flooding of the market with cheap, substandard goods at minimum prices, leading to a breaking down of prices of even high-grade goods and eventually rendering the production of certain lines profitless so that they have to be abandoned.

Hose Manufacturers Unite

That manufacturers realize that the time for some action has arrived appears from the fact that on October 3 an Association of German Factories of Woven Rubberized Hose was formed, the aim of which will be to maintain prices and quality. The new association, with headquarters in Berlin, under the direction of Walter Lindemann, has decided that dealers must agree to charge consumers at least 15% more than their cost price. There has been a breakdown in prices accompanied by a corresponding lowering of quality, which, of course, in the case of fire hose is serious.

Again it is reported that certain manufacturers of technical rubber goods have individually taken steps to curb the prevailing hand-to-mouth system of buying. This practice has reached the stage where dealers in technical goods at times do not scruple to place rush orders for a single article of a kind, worth a few marks. Now some manufacturers have notified dealers that an extra charge of 2.50 marks will be added on all orders for single articles of a value of less than 2.50 marks, and of 2 marks on such orders when the value is from 2.50 to 5 marks.

How effective these measures will be remains to be seen. So far most attempts here at putting business on a sounder basis have had little result. Thus the price fixing convention for tires (the term agreed upon has meanwhile expired, and negotiations are said to be under way to renew it), has been unable to eliminate further price cutting. According to the Chambers of Commerce, Frankfurt a. M. Hanau, a 2% rebate had to be conceded dealers to improve their margin of profit narrowed by the increased sales tax. Then the competition that is raging in the cycle tire business led to an additional cut of about 5% so that business in the latter line at least is well-nigh profitless.

Synthetic Rubber

Despite overproduction and unequalled low prices of crude rubber German chemists have been unremitting in their efforts to improve synthetic rubber; consequently now appear special grades for the various parts of tires: sidewalls, treads, etc. In addition experiments have been conducted with mechanical goods: hose, packing, etc., to test resistance to acids, fats, steam. While disappointments have occurred, much has already been attained, and efforts to achieve still more continue unceasingly. As the *Gummi-Zeitung* points out, whereas Germany had only 3 or 4 kinds of synthetic to fall back on during the World War, a large variety of types, each adapted for special kinds of goods, is at present available, and a rubber famine, as in the last war, would not now take Germany unawares. Another effect of the progress in the production and application of synthetic rubber would be to prevent the price of natural rubber going too high.

Rail Cars in Austria

Experiments are also being conducted in Austria with pneumatic tired rail cars, the *Commercial Motor* learns. The Austro-Daimler-Puckwerke, Vienna, has introduced a steel frame car with streamline body, seating 30 persons and capable of over 60 m.p.h. The car is equipped with special wheels of what are practically 2 distinct detachable disk wheels. One, having a pneumatic tire, is secured to the axles in the usual way, while the other has a steel-flanged tire and is attached to and supported through ball bearings on a short hollow axle casing. The steel tire has an internal flat surface against which bears the full tread of the pneumatic tire.

Rubber Industry in Far East

MALAYA

Footwear Exports

Until quite recently it was not realized to what extent the manufacture of rubber footwear had developed in Malaya owing to Tan Kah Kee. This manufacture reached its highest point in 1929 when exports of canvas, rubber-soled shoes from Malaya were 536,803 dozen pairs, placing the colony fourth among world exporters of these articles. In that year all the exports except insignificant amounts to other countries went to China, the Dutch East Indies, British East Indies, and other countries in the Far East, in several of which Tan Kah Kee had developed an excellent distribution system through local Chinese merchants. These exports fell almost by half in 1930, when total shipments were 285,435 dozen pairs, and showed a further decline to 218,861 dozen pairs in 1931 and to 107,764 dozen pairs for the first half of 1932. These declines were due primarily to greatly decreased shipments to China and other Oriental countries; but shipments to Great Britain, which in 1929 had been only 19 dozen pairs, were 4,666 dozen pairs in 1930. For 1931 and 1932 exports are not listed by separate countries, but 3,256 dozen pairs still went to Europe in 1931, and during the first half of 1932 the amount even increased to 5,578 dozen pairs. It is further interesting to find that in 1930 the shipments to the Philippines and Sulu Archipelago were 11,133 dozen pairs against 1,970 the year before.

Root Disease

An important article on the root disease of rubber trees caused by *Fomes lignosus*, by R. P. N. Napper, appears in the July, 1932, issue of the *Journal of the Rubber Research Institute of Malaya*, in which opinions are expressed which differ radically from those hitherto held.

Fomes lignosus causes one of the 2 most destructive root diseases of rubber in Malaya, being particularly active during the first 5 years of a new plantation. The fungus inhabits the soil and migrates by means of white, rhizomorphic strands. Treatment of young clearings has been based on the theory that incidence of the root disease varies directly with the amount of rotting timber in and upon the soil at the time of planting, and, consequently, the greater the amount of timber removed at the time, the less the future stand of trees will suffer from root disease. As a result, the popular practice of so-called clean-clearing became established in bringing a newly felled jungle area into cultivation.

Then J. R. Weir, of the Institute, initiated a number of experiments, later directed by Mr. Napper, and it was eventually found that the theory on which clean-clearing was based is wrong. It developed that up to an age of 3 years rubber trees are actually exposed to a greater risk of infection in the usual clean-cleared areas than in uncleared areas where secondary jungle is allowed to grow as a natural cover.

Owing to the presence of the disease in the jungle before felling, the fungus spreads when its food material begins to be exhausted by clean-clearing. Hence the food supply for the fungus is limited and soon exhausted, so the fungus quickly forms rhizomorphs which attack the roots of rubber trees.

On the other hand, if an increasing amount of timber is left in the soil at the time of planting, there is an increasing food supply available for the fungus, thus delaying the formation of rhizomorphs which will find other material than rubber roots to feed on.

Stabilizing Latex

Important points connected with the preservation and shipment of latex (collection, preserving, packing, creaming, sampling, etc.,) are discussed by R. O. Bishop and R. G. Fullerton in "Planting Manual 4," issued by the Rubber Research Institute of Malaya.

As to preserving latex, the authors point out that ammonia in gas form is not only more convenient to handle, but is also relatively cheaper than the liquid. Its cost per gallon of latex is 2.70 cents against 5 cents when the liquid is used.

Caustic soda and caustic potash have also been found useful as latex preservatives; and from the point of view of the estate are preferable to ammonia, for they are cheaper and non-volatile. Several estates have already obtained contracts for the supply of latex preserved with caustic potash, and it is likely that the use of a caustic alkali as preservative will increase.

Examination of samples of latex treated with caustic alkalis sent from Malaya to the Imperial Institute in England showed that rubber obtained from these samples has a low vulcanizing temperature and exhibits a wide range of cures and good physical properties; aging of vulcanized films of evaporated latex was abnormally good; the latex has a comparatively high stability which facilitates the incorporation of compounding ingredients; and it is also well suited to concentration purposes. On the other hand the high stability is unsuitable in certain manufacturing processes as those involving gelation to produce molded products or coagulation of the latex on dipping forms.

It is interesting to note that one manufacturer to whom samples of latex preserved with caustic alkalis and ammonia were submitted stated that for producing inner tubes by electro-deposition, ammoniated latex was not suitable; while caustic alkali preserved latex, particularly if a minimum rubber content of 60% could be guaranteed, was useful.

Creaming Latex

In the matter of creaming, the Research Institute is investigating the acceleration and perfection of the natural tendency of latex to cream by adding an alkali and substances as gum tragacanth, ammonium, and sodium alginates, carragheen moss, and Iceland moss. This problem is receiving special attention as the apparatus required is very simple so that estates would require no new plant nor would they have to make radical changes in existing arrangements in the factory. In addition the field is less restricted by patent rights than other methods of producing latex with higher rubber content. Of the above named agents, gum tragacanth has been found the most suitable, and concentrates with dry rubber content of 50 to 56% are regularly prepared at the Institute at a comparatively low cost.

Finally, the authors append a table showing the comparative F. O. B. costs for ordinary ammoniated latex, pale crepe, and ribbed smoked sheet in cents per pound of dry rubber. S. S. Cent. = $0.00567 U. S. equivalent.

Comparative F. O. B. Costs of Sheet, Crepe, and Latex

Cents per Pound of Dry Rubber

	Sheet		Crepe		Latex	
Tapping and collecting		2.00		2.00		2.00
General charges		3.00		3.00		3.00
Upkeep and cultivation		0.10		0.10		0.10
Manufacturing						
Engine and fuel oil	0.04		0.25		....	
Chemicals	0.09		0.12		0.66	
Curing fuel	0.03		....		....	
Labor	0.14		0.38		0.42	
Utensils	0.06	0.36	0.15	0.90	....	1.08
Packing and dispatch						
Cases	0.46		0.70		1.73	
Carriage	0.28	0.74	0.32	1.02	0.54	2.27
Total		6.20		7.02		8.45

NETHERLANDS EAST INDIES

Native Rubber

The Eleventh Report on Native Rubber Cultivation, covering the second quarter of 1932, now issued, shows how sensitive are the native exports to fluctuations in price. The decline in price in March, 1932, resulted in the export during April of only 3,134 tons, the lowest in several years. The slight increase in the beginning of May was followed by a corresponding increase of shipments in that month; the stabilization of prices in the latter part of June and the further increase in July once more stimulated exports. The total during the quarter under review, however, was only 10,613 tons, 5,270 metric tons less than for the first quarter of 1932 and nearly 13,000 tons below those for the corresponding period of 1931. As compared with 1931, the period shows a decline in exports of 43% and compared with 1929, when native exports were at their peak, of 52%.

In Riouw (Indragiri), Djambi, and West Borneo, the main native rubber centers the decline is lowest and against 1931 averaged 32%; in East Coast Sumatra the decline was 46%; South and East Borneo, 50%; and Palembang, 65%. In the other sections, which to be sure never produced a very great deal, exports have shrunk to insignificant proportions, and in the case of West Coast of Sumatra have fallen by 98% as compared with 1931; in Atjeh, Tapanoeli, and Banka, between 81 and 83%, and in Billiton 89%.

Interesting sidelights are thrown on the trend of affairs in the different provinces. Thus in Djambi, the most important native center, natives are turning more and more to collecting jungle products and other ways of earning a living; here and there old trees are cut out, and it appears that the practice will assume larger proportions if prices do not rise soon. On the other hand, if the cost of living does not increase, it is thought likely many people will tap to capacity at a price of 10 guilder cents per kilogram, and in some cases even at a price of 7 guilder cents. In a village in Palembang the population has started manufacturing very primitive rubber shoes which are sold at the local bazaar at from 40 to 50 guilder cents per pair. (Guilder = $0.402 U. S. equivalent.)

While on the whole there is little interest in rubber in West Borneo, no rubber has been cut out, and here and there planting has been extended. Yet cutting out of rubber in South and East Borneo is becoming more general.

Export Crops

A recent report[1] gives detailed data concerning the export crops of the Netherlands East Indies in 1931. Information concerning rubber was supplied by 1,059 estates with total area of 1,732,376 hectares. Java accounts for 532 estates covering 682,985 hectares, and the Outer Possessions, including Sumatra, 527 estates, 1,049,391 hectares in extent. Over 40% of the total acreage, or 698,660 hectares, is now planted, an increase of 11,000 hectares over the preceding year; the planted area in Java was 318,262, 46.6% of its total; in Sumatra 359,750 hectares, 37.3% of its total; and in the rest of the Outer Provinces only 20,628 hectares, 24.2%. It is therefore evident that the estates, particularly in Sumatra, have large reserves of unplanted land.

Not all of the land on rubber estates is devoted to Hevea. Of the total planted area, 698,640 hectares, about 83%, or 582,278 hectares, is under Hevea, and of this 47,851 hectares is interplanted with other crops, chiefly coffee; 397,039 hectares are rubber estates exclusively; and the rest, 137,388 hectares, is on multiple-crop estates, but on separate blocks, and is therefore also pure rubber. The interplanted area, 47,851 hectares, chiefly on young estates where the secondary crop is later removed, is declining from year to year. The practice of growing other crops in addition to rubber, either interplanted or on separate blocks, is commonest in Java, where it is found on 331 estates in Eastern Java only 16,849 hectares of a total 81,651 hectares are unmixed Hevea.

The total rubber area now producing is 382,282 hectares against 339,000 hectares in 1927, an increase of 43,000 hectares in 5 years. The increase took place chiefly on pure rubber estates or on estates where rubber was grown along with other crops, but on separate lots and would have been 50,000 hectares, but there was a decrease of 7,000 hectares on interplanted areas.

Practically all the rubber now being tapped was planted before 1926. This point indicates that on the whole, trees are not tapped before they enter their 7th year.

A marked decline occurred in the area of new planting undertaken in 1931, 18,094 hectares against 31,650 the year before; of this 13,132 hectares against 22,701 hectares were added in Sumatra, 4,531 against 7,823 hectares in Java, and 431 against 1,126 hectares elsewhere. To balance this, 9,026 hectares were abandoned in 1931, 4,844 hectares in Java, 3,345 in Sumatra, and 837 elsewhere.

To ascertain to what extent estates are reacting to prevailing unfavorable conditions, data were collected concerning potential and actual outputs for 1931, and potential and estimated outputs for 1932. These figures follow:

1931	Potential Production Tons	Actual Production Tons	Actual in % of Potential Production
Java	78,776	70,884	90.0
Outer Provinces	103,562	94,915	91.7
Total N. E. I.	182,338	165,799	90.9

1932	Potential Tons	Estimated Tons	Estimated in % of Potential
Java	82,380	59,179	71.8
Outer Provinces	108,256	90,152	83.3
Total N. E. I.	190,636	149,331	78.3

The output per hectare for all Netherlands East Indies was at 440 kilograms in 1931 against 414 kilograms in 1930; for Java alone the figures were 435 against 423 kilograms, and in the Outer Possessions (including Sumatra), 442 against 410 kilograms. In considering these outputs, it must be remembered that owing to the abnormal conditions now prevailing on estates an absolutely accurate calculation was not possible.

Liquid latex exports in 1931 for all practical purposes may be said to have come from Sumatra since of the total 10,578,000 kilograms (dry rubber equivalent, 3,526 metric tons) only 9,000 kilograms were from Java. But the latter country exported 5,090,264 kilograms of sprayed rubber in 1931 against 4,248,006 kilograms in 1930; while Sumatra shipped 11,307,716 kilograms in 1931 and 7,928,736 kilograms in 1930. The latex outputs are included in the estate outputs of rubber since estates report the rubber content of the latex as rubber. (Kilogram = 2.2046 pounds U. S. equivalent.)

By way of comparison, the liquid latex shipments from Malaya and Ceylon are also given; for the former, 3,418,917 liters (1,023.4 metric tons dry rubber equivalent), against 3,705,754 liters (1,109.3 metric tons dry), and for the latter 6,960 liters (2 metric tons dry) against 3,000 liters (0.9 metric ton dry). Sumatra is by far the biggest exporter of latex.

Turkey

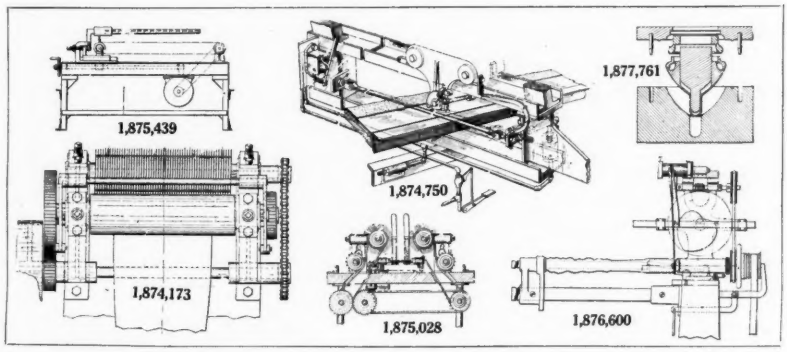
A Swedish firm, Gislaved Limitet Sirketi, has established a large factory at Eyub, near Istambul, chiefly for making rubber soles and footwear. The factory, said already to be operating on a good scale, plans eventually to cover all Turkey's needs of footwear and soles, goods which were formerly mainly imported from Russia.

Extra French Duty

To provide funds for assisting French rubber growers in Indo-China, an extra duty is levied on imports of foreign crude rubber, rubber goods, and waste. On the first item this duty is 30 centimes per kilogram; on rubber goods the duty levied is on a fixed percentage of the total weight. Thus the weight proportion dutiable of clothing and accessories of rubberized fabric (except dress shields, garters, belts, suspenders, elastic goods, hose for varicose veins, knitted elastic belts, and supports), is 25%; of belts of rubber sheet or strips, 35%; varnish with rubber base 25%; hard rubber buttons, 35%; football bladders and tennis balls, 70%; rubber-lined tobacco pouches, 95% on the rubber lining. The duty on waste is 50 centimes per 100 kilograms, but old tires may have to pay the 30 centimes per kilogram on the fixed percentage of their weight, as the items above. (Centime=$0.000392 U. S. equivalent. Kilogram=2.2046 pounds.)

[1] *Bulletin No. 104 of the Central Bureau of Statistics, N. E. I.*

Patents and Trade Marks



MACHINERY

United States

1,874,173.* **Cutter.** The special merit claimed for this cutting machine is that it is capable of producing effectively and economically square edged strips of rubberized fabric material from such material as worn or defective tire carcasses. M. E. Davis, assignor to Leo Meyer Co., both of Akron, O.

1,874,750.* **Bias Cutter.** A means is provided for facilitating the traversing movement of the rotary cutter and endless belt conveyer of the Shook bias cutter for rubberized fabric used in tire manufacture. Means are also provided whereby the feeding movement of the conveyer is effected automatically during the return stroke of the reciprocating carriage upon which the cutter is mounted. A. L. Heston, Akron, O., assignor to Seiberling Rubber Co., a corporation of Del.

1,875,028.* **Bead Forming Device.** So-called beaded or rolled edges are essential to give resistance against tearing to dipped goods when stretched. This patent covers a device by which the thin film of rubber deposited on the glass dipping form is rolled back upon itself by a set of revolving brushes acting upon the unvulcanized rubber. Y. H. Kurkjian, Hawthorne, N. J., assignor to Carl J. Schmid, Inc., New York, N. Y.

1,875,439.* **Belt Tester.** This invention relates to testing endless belts. One of its principal objects is the measurement of sidewise movement of an endless flat belt while the latter is operated under tension over pulleys. W. H. Gerstenslager, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,876,600.* **Thread Forming Apparatus.** Continuous rubber threads or strips can be cut with rapidity and precision by this apparatus. The rubber to be cut is in the form of a vulcanized tube mounted on a rotating mandrel with a shearing edge maintained by a spiral spring in close contact with the shearing edge of a revolving knife. The thread, as cut, is wound upon a spool located over the cutting head. F. W. Bommer and C. E. Clark, both of Winchester, assignors, by mesne assignments, to Stowe-Woodward, Inc., Newton, all in Mass.

1,877,761.* **Nipple Mold.** The design of this mold provides for forming a heavy-base nipple cored out to provide a flexible edge so shaped as to grasp firmly the beaded edge of the top of a nursing bottle. The restricted flange portion of the nipple accommodates itself to various diameters of bottles. F. Brown, assignor to General Health Corp., both of Philadelphia, Pa.

1,879,063. **Tire Building Form.** R. L. Bruck, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,879,194. **Tire Retread Vulcanizer.** L. O. Grange, assignor to W. J. Jarratt, both of Chicago, Ill.

1,879,379. **Vulcanizer.** C. Macbeth, Four Oaks, England.

1,879,520. **Fabric Impregnating Machine.** E. A. Rusden, Nayatt, assignor to Textile-Finishing Machinery Co., Providence, both in R. I.

1,879,548. **Tire Mold Venting Machine.** R. W. Sethman, Cuyahoga Falls, assignor to National Rubber Machinery Co., Akron, both in O.

1,879,753. **Shoe Sole Press.** J. Kewley, Nelson, England.

1,880,264. **Golf Ball Winder.** C. S. McChesney, Kenmore, assignor to Dunlop Tire & Rubber Corp., Buffalo, both in N. Y.

1,880,304. **Elastic Fabric Knitting Machine.** O. H. Walton, Needham, Mass.

1,880,328 and 1,880,329. **Inner Tube Tester.** D. H. Miller, Kearney, Neb.

1,880,376. **Mandrel Joint.** P. C. Dutton, Nutley, N. J., and E. Hazell, New York, N. Y., assignors to Morgan & Wright, Detroit, Mich.

1,880,405. **Valve Stem Internal Thread Tester.** L. C. Broecker, Bridgeport, Conn., assignor to Firestone Steel Products Co., Akron, O.

1,880,407. **Repair Vulcanizer.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,880,430. **Tire Mold.** A. R. Furnas, Uniontown, assignor to Firestone Tire & Rubber Co., Akron, both in O.

1,880,452. **Powdered Material Feeder.** R. D. Hulslander, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,880,462. **Mold Separator.** A. B. Mullin, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,880,463. **Tire Remover.** A. B. Mullin, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,880,518. **Laminated Article Device.** W. C. Stevens, Uniontown, and H. D. Stevens, assignors to Firestone Tire & Rubber Co., both of Akron, all in O.

1,880,519. **Tire Builder.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,880,873 and 1,880,874. **Press.** J. Derry, Medford, assignor to A. Terkelsen, Newton, both in Mass.

1,880,910. **Tire Patch Beveler.** C. E. Dunlap, Sioux City, Iowa.

1,880,917. **Insulated Coating Tester.** W. H. Eastlake, Mt. Royal, P. Q., Canada, assignor to Western Electric Co., Inc., a corp. of N. Y.

1,881,001. **Vulcanizing Device.** R. F. Ternes, assignor to Morgan & Wright, both of Detroit, Mich.

1,881,005. **Glove Dipping Form.** P. H. Watkins, Leonia, N. J., assignor to National India Rubber Co., Bristol, R. I.

1,881,021. **Rubber Article Form.** E. Hazell, New York, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,881,248. **Footwear Mold.** H., A., and G. Steppé, all of Berchem-Ste.-Agathe, Belgium.

1,881,276. **Tire Bead Fabricating Device.** W. E. Humphrey, assignor to Mason Tire & Rubber Corp., both of Kent, O.

1,881,489. **Boot Vulcanizer.** A. A. Glidden and T. M. Knowland, both of Watertown, Mass., assignors, by mesne assignments, to Hood Rubber Co., Inc., Wilmington, Del.

1,881,628. **Vulcanizer with Wedge Lock.** J. Jennejohn, assignor to Utility Mfg. Co., both of Cudahy, Wis.

1,881,670. **Shoe Machine.** F. D. Kinney, Southbridge, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,881,994. **Mixer.** F. H. Banbury, assignor to Farrel-Birmingham Co., Inc., both of Ansonia, Conn.

1,882,118. **Tire Casing Remover.** H. A. Cherry, Montebello, Calif.

1,883,018. **Tire Vulcanizer.** F. J. Shook, assignor to National Rubber Machinery Co., both of Akron, O.

1,883,531. **Extrusion Apparatus.** C. C. Bunker, Tallmadge, assignor to Akron Standard Mold Co., Akron, both in O.

1,883,557. **Tire Tester.** M. E. Cheney, La Crosse, Wis., assignor, by mesne assignments, to Moto Meter Gauge & Equipment Corp., Long Island City, N. Y.

1,883,704. **Ball Covering Device.** J. O. Goodwin, Akron, assignor to Seiberling Latex Products Co., Barberton, both in O.

1,883,729. **Tire Trimmer.** J. I. Haase, Akron, O.

1,884,324. **Vulcanizing Apparatus.** R.

*Pictured in group illustration.

W. Snyder, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,884,342. **Mask Mold.** H. Stelzner, assignor to O. H. Drager, both of Lubeck, Germany.

1,884,612. **Steam Platen.** R. W. Dinzl, assignor to Southwark Foundry & Machine Co., both of Philadelphia, Pa.

Reissue

18,625. **Rubber Thread Machine.** J. R. Gammeter, Akron, O.

Dominion of Canada

326,452. **Heel Plunger Mold.** V. R. Lawson, Roslindale, Mass., U. S. A.

326,641. **Vulcanizing Heat Unit.** K. Honeyman, Rocklea, and H. R. Dougherty, Yeronga, co-inventors, both of Queensland, Australia.

326,740. **Cord Tester.** Goodyear Tire & Rubber Co., assignee of G. D. Mallory, both of Akron, O., U. S. A.

326,824. **Drop Side Telescopic Drum.** P. A. Frank, Fairlawn, O., assignee of W. E. Swern, Kokomo, Ind., U. S. A.

United Kingdom

375,124. **Can Lid Applier.** Etablissements J. J. Carnaud & Forges De Basseindre, Paris, France.

375,157. **Doubling and Impregnating Machine.** V. Antoine, Lambermont, Belgium.

375,374. **Wire Coating Machine.** M. C. Wade and W. S. Sharpe, both of London, (representatives of H. Wade). (Vultex, Ltd., St. Helier, Jersey).

375,541. **Nipple Mold.** F. Brown, Philadelphia, Pa., U. S. A.

376,002. **Continuous Sheet Vulcanizer.** E. Frölich, Harz, Germany.

376,054. **Tire Vulcanizing Mold.** Siemens-Schuckertwerke A. G., Berlin, Germany.

376,184. **Kneading Machine.** A. Lasch and E. Strömer, both of Stuttgart, Germany, and Baker Perkins, Ltd., London.

376,400. **Tire Casing Machine.** Dunlop Rubber Co., Ltd., London, H. Willshaw and F. G. Broadbent, both of Dunlop Rubber Co., Ft. Dunlop.

376,586. **Rubber Cutter and Duster.** Firestone Tyre & Rubber Co., Ltd., Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

376,779. **Golf Ball Thread Winder.** Sibley-Pym Corp., Lynn, assignee of A. F. Pym, Swampscott, both in Mass.

377,269. **Rubber-faced Concrete Block Mold.** Universal Rubber Paviors, Ltd., and L. Gaisman, both of Manchester, and A. F. Sexton, Ashton-under-Lyne.

377,403. **Tire Core.** Morgan & Wright, assignee of A. O. Abbott, both of Detroit, Mich., U. S. A.

Germany

561,260. **Rubber Thread Winder.** Etablissements Ch. Faure-Roux, Ste. Chamont, Loire, France. Represented by G. Dollner, M. Seiler, E. Maemecke, B. Wehr, and W. Kuhl, all of Berlin.

561,878. **Tire Mold.** Aluminum, Ltd., Toronto, Ont., Canada. Represented by A. Trautmann.

PROCESS

United States

1,880,372. **Reclaiming Vulcanized Rubber Fiber Products.** A. W. Bull, Naugatuck, assignor to Rubber Regenerating Co., New Haven, both in Conn.

1,880,968. **Purifying Wild Rubber.** J. K. Mitchell, Villanova, Pa., assignor to Dispersions Process, Inc., Dover, Del.

1,881,048. **Inflatable Hollow Article.** I. and L. Dorogi, both of Budapest, assignors of ½ to Dr. Dorogi & Co. Rubber Goods Factory, Ltd., Budapest-Albertfalva, all in Hungary.

1,881,253. **Ornamented Articles.** G. W. Trobridge, Sutton Coldfield, assignor to Dunlop Rubber Co., Ltd., Birmingham, both in England.

1,881,337. **Sheet Material.** G. H. Willis, Akron, assignor to Tanseib Co., Barberton, both in O.

1,881,785. **Cleaning and Vulcanizing Cables.** F. S. Malm, Chicago, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,882,377. **Regulating Plant Growth.** T. Whittelsey, Ringoes, N. J.

1,882,642. **Cutting Elastic Webbing.** G. H. Jung, Jr., assignor to Jung Arch Brace Co., both of Cincinnati, O.

1,882,792. **Preformed Composition Strip.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corp. of O.

1,883,645. **Product from Mica Splittings.** C. Ellis, Montclair, N. J., assignor to Ellis-Foster Co., a corp. of N. J.

1,883,973. **Uniting Rubber to Metal.** S. S. Kurtz, Jr., assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,884,106. **Gassed Sheet Rubber.** E. J. Moran, Chicago, assignor, by mesne assignments, to W. S. Robinson, Evanston, and E. J. Moran, Chicago, as trustees, all in Ill.

1,884,118. **Reconditioning Old Rubber.** A. W. Morton, Balaclava, assignor to C. C. Jackson, Melbourne, both in Australia.

1,884,685. **Reconditioning Printing Plates.** L. Hill and J. D. Hobby, both of Raleigh, N. C.

Dominion of Canada

326,386. **Uniting Rubber to Rigid Material.** B. F. Goodrich Co., New York, N. Y., assignee of O. A. Thompson, Columbus, O., both in the U. S. A.

326,387. **Vulcanizing Hard Rubber.** B. F. Goodrich Co., New York, N. Y., assignee of G. Oenslager, Akron, O., both in the U. S. A.

326,537. **Rubber Coating.** Dunlop Rubber Co., Ltd., London, assignee of D. F. Twiss, A. A. Round, and E. A. Murphy, co-inventors, all of Birmingham, all in England.

326,630. **Wire Coating.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignees of F. H. Lane, E. W. Madge, and E. A. Murphy, co-inventors, all of Birmingham, England.

327,004. **Goods from Aqueous Dispersions.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignees of E. W. Madge, Birmingham, England.

327,005. **Rubber Goods Production.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignees of E. A. Murphy, Birmingham, England.

United Kingdom

375,717. **Waterproof Fabric.** Rainex, Ltd., and L. Kay, both of Manchester.

375,987. **Ornamenting Metal Surfaces.** Dunlop Rubber Co., Ltd., London, and A. Lakeman, of Dunlop Rubber Co., Ft. Dunlop.

376,456. **Ornamenting Inflatable Toys.** I. and L. Dorogi, and Dr. Dorogi Es Társa Gummigyar R. T., all of Budapest, Hungary.

376,973. **Latex Thread.** U. Pestalozza and Soc. Italiana Pirelli, both of Milan, Italy.

Germany

560,726. **Plastic Design on Rubber.** Fromms Act. Julius Fromm, Berlin-Kopenick.

560,727. **Molded Hollow Bodies.** Magyar Ruggyantaarugyar Resvenytarsasag, Budapest, Hungary. Represented by C. Clemente, Berlin.

560,728. **Perforated Tubes.** Societa Italiana Pirelli, Milan, Italy. Represented by A. Bursch and R. Gutmann, both of Berlin.

560,866. **Rubber-tipped Laces.** A. Schoeler, Wuppertal-Barmen.

561,172. **Dress Shields.** Gummiwarenfabrik M. Steinberg, Koln-Braunsfeld.

CHEMICAL

United States

1,879,068. **Accelerator.** H. M. Bunbury and W. J. S. Naunton, both of Manchester, and W. A. Sexton, Huddersfield, all in England, assignors to Imperial Chemical Industries, Ltd., a corp. of Great Britain.

1,879,543. **Coagulation of Emulsions.** F. Schwerdtel, Cologne-Mulheim, assignor to I. G. Farbenindustrie A. G., Frankfurt a. M., both in Germany.

1,880,036. **Rubber Composition.** E. W. Lovering, assignor to Brown Co., both of Berlin, N. H.

1,880,300. **Accelerator.** W. P. TER Horst, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,880,421. **Accelerator.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,880,527, 1,880,528, and 1,880,529. **Accelerator.** J. Teppema, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,880,601. **Gypsum - Rubber Composition.** F. H. Untiedt, Chevy Chase, Md.

1,880,975. **Latex Treatment.** A. A. Nikitin, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,881,142. **Can Sealing Composition.** A. H. Smith, Akron, and C. L. Shreiner, Barberton, assignors to Rubber Service Laboratories Co., Akron, all in O.

1,881,166. **Accelerator.** O. Behrend, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,881,172. **Wetting Agent.** K. Daimler and K. Platz, both of Frankfurt a. M. Hochst, assignors to I. G. Farbenindustrie A. G., Frankfurt a. M., all in Germany.

1,881,989. **Chewing Gum.** V. L. Woodward, Stone Ridge, N. Y.

1,882,035. **Accelerator.** D. H. Powers, Penns Grove, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,882,081. **Insulating Adhesive.** A. R. Kemp, Westwood, N. J., assignor to Bell Telephone Laboratories, Inc., New York, N. Y.

1,882,976. **Synthetic Conversion Products.** O. Schmidt and G. Niemann, both of Ludwigshafen a. R., and E. Meyer, Mannheim, assignors to I. G. Farbenindustrie A. G., Frankfurt a. M., all in Germany.

1,883,106. **Shoe Bottom Filler.** A. Thoma, Cambridge, assignor to North American Chemical Co., Boston, both in Mass.
1,883,877. **Age Resister.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,883,878. **Accelerator.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,884,123 and 1,884,124. **Accelerator.** P. I. Murrill, E. Norwalk, Conn., assignor to R. T. Vanderbilt Co., Inc., New York, N. Y.
1,884,240. **Rubber Composition.** E. O. Rhodes and F. D. Hager, both of Pittsburgh, Pa., assignors to American Tar Products Co., a corp. of Del.
1,884,885. **Age Resister.** L. B. Sebrell and A. M. Clifford, assignors to Goodyear Tire & Rubber Co., all of Akron, O.
1,884,889. **Age Resister.** W. L. Semon, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.

Reissue

18,607. **Age Resister.** A. M. Clifford, Stow, assignor to Goodyear Tire & Rubber Co., Akron, both in O.

Dominion of Canada

326,538. **Coating Composition.** Dunlop Rubber Co., Ltd., London, assignee of F. C. Jennings, Birmingham, both in England.
326,726. **Synthetic Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany, assignee of Winthrop Chemical Co., Inc., New York, N. Y., U. S. A., assignee of K. Meisenburg, Leverkusen, and W. Bock, Koln-Mulheim, co-inventors, both in Germany.
326,727. **Synthetic Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany, assignee of Winthrop Chemical Co., Inc., New York, N. Y., U. S. A., assignee of E. Tschunkur and W. Bock, co-inventors, both of Koln-Mulheim, Germany.
326,739. **Age Resister.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

United Kingdom

375,298. **Paving Composition.** E. O. Cowper, London.
375,360. **Age Resister.** Imperial Chemical Industries, Ltd., London, H. M. Bunbury, J. S. H. Davies, and W. J. S. Naunton, all of Manchester.
375,446. **Airbag Age Resister.** Firestone Tyre & Rubber Co., Ltd., Middlesex, assignee of E. T. Handley, Akron, O., U. S. A.
375,462. **Fibrous Composition.** A. Ferretti, Milan, Italy.
375,786. **Coating Composition.** Dunlop Rubber Co., Ltd., London, and F. C. Jennings, of Dunlop Rubber Co., Ft. Dunlop.
375,845. **Latex Treatment.** A. Ferretti, Milan, Italy.
375,972. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
376,022. **Rubber Emulsions.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of E. Hazell, New York, N. Y., both in the U. S. A.
376,033. **Flooring Composition.** Flintkote Co., Boston, Mass., U. S. A.
376,114. **Latex Cement.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.
376,318. **Rubber Sheet.** P. Schidrowitz, M. W. Philpott, and R. M. Ungar, all of London.
376,432. **Sponge Rubber.** Metallges. A. G., Frankfurt a. M., Germany.
376,752. **Age Resister.** Rubber Service Laboratories Co., Akron, O., assignee of J. R. Ingram, Nitro, W. Va., both in the U. S. A.
376,818. **Age Resister.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
376,844. **Puncture Sealing Composition.** J. W. Wade, Swansea.
376,929. **Accelerator.** Chemische Fabriken Dr. K. Albert Ges., Amöneburg, Germany.
377,174. **Accelerator.** Naugatuck Chemical Co., assignee of W. E. Messer, both of Naugatuck, Conn., U. S. A.
377.190. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
377,253. **Accelerator.** Imperial Chemical Industries, Ltd., London, R. Robinson, of Dyson-Perrin Laboratory, Oxford, and H. M. Bunbury, J. S. H. Davies, and W. J. S. Naunton, all of Manchester.
377,257. **Plastic Composition.** Chloride Electrical Storage Co., Ltd., Clifton Junction.
377,291. **Abrasive Composition.** Carborundum Co., Ltd., Manchester, assignee of R. C. Benner, Niagara Falls, N. Y., U. S. A.
377,730. **Accelerator.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
377,749. **Rubber Cement.** Ungarische Gummiwaarenfabriks A. G., Budapest.
377,751. **Microporous Rubber.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, and E. W. Madge, Ft. Dunlop.
377,782. **Latex-Fiber Composition.** Dewey & Almy Chemical Co., assignee of W. B. Wescott, both of N. Cambridge, Mass., U. S. A.
377,785. **Fibrous Composition.** Dewey & Almy Chemical Co., assignee of R. M. Day, both of N. Cambridge, Mass., U. S. A.
377,862. **Waterproof Composition.** F. T. Lakin, Derby, and J. Leach and H. Cartlidge, both of Loughborough.

Germany

560,259. **Concentrating Latex.** Deutsche Pektingesellschaft m.b.H., Frankfurt a.M.
569,353. **Vulcanization Accelerator.** I. G. Farbenindustrie A.G., Frankfurt a.M.
560,394. **Accelerating Vulcanization.** I. G. Farbenindustrie A.G., Frankfurt a.M.
560,395. **Natural and Synthetic Rubber Preservative.** I. G. Farbenindustrie A.G., Frankfurt a.M.
560,622. **Latex Paste.** I. G. Farbenindustrie A.G., Frankfurt a.M.
561,568. **Microporous Rubber.** H. Beckmann, Berlin-Zehlendorf.
562,657 and 562,658. **Porous Rubber.** A. Mathiesen, Oslo, Norway. Represented by G. Reichert, Berlin.

GENERAL

United States

1,879,017. **Ladder Safety Appliance.** J. F. Babitt, Wellington, O.
1,879,348. **Pneumatic Tire Core.** C. E. Lawson, Utica, O.
1,879,404. **Tire Inflater.** F. K. Moody, Chicago, Ill.
1,879,554. **Combination Sign.** A. C. Simkins, Pleasantville, N. J.
1,879,602. **Sharp Freezing Container.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.
1,879,726. **Swimming Device.** E. Berger, Salzburg, Austria.
1,879,790. **Detachable Tread Tire.** D. J. Campbell, Muskegon Heights, Mich.
1,880,060. **Cable.** G. L. Wanamaker, Ambridge, Pa., assignor to National Electric Products Corp., New York, N. Y.
1,880,109. **Doll.** M. Sanders, assignor to Ideal Novelty & Toy Co., both of Brooklyn, N. Y.
1,880,190. **Door Bumper.** R. F. Anderson, Detroit, Mich., assignor to Murray Corp. of America, a corp. of Del.
1,880,280. **Resilient Support.** J. R. Replogle, Detroit, Mich., assignor to Copeland Products, Inc., a corp. of Mich.
1,880,303. **Elastic Knitted Fabric.** O. H. Walton, Needham Heights, Mass.
1,880,389. **Footwear.** E. C. Heilhecker, assignor to National India Rubber Co., both of Bristol, R. I.
1,880,489. **Pneumatic Tire Casing.** E. A. Roberts, assignor to Firestone Tire & Rubber Co., both of Akron, O.
1,880,504. **Vibration Insulator.** J. W. Shields, assignor to Firestone Tire & Rubber Co., both of Akron, O.
1,880,654. **Footwear Cushion.** E. Baird, Los Angeles, Calif.
1,880,696, 1,880,697, and 1,880,698. **Channel Strip.** R. Beynon, assignor to Dryden Rubber Co., both of Chicago, Ill.
1,880,699. **Channel Strip.** R. Beynon, Chicago, and G. C. Reeves, Glen Ellyn, assignors to Dryden Rubber Co., Chicago, all in Ill.
1,880,700. **Channel Strip.** R. Beynon, assignor to Dryden Rubber Co., both of Chicago, Ill.
1,881,026. **Pneumatic Tire.** J. E. Lorentz, Akron, assignor to India Tire & Rubber Co., Mogadore, both in O.
1,881,109. **Phonograph Pick-up.** H. Wiener, Bisbee, Ariz.
1,881,155. **Shock Absorber.** H. J. Weydert, Levallois Perret, France.
1,881,231. **Bumper Guard.** W. C. Jackson, assignor to Tingley Reliance Rubber Corp., both of Rahway, N. J.
1,881,308. **Resilient Centering Device.** F. H. Beamer, Buffalo, N. Y.
1,881,309. **Tire.** G. Campu, Detroit, Mich.
1,881,312. **Vehicle Buffer and Drawgear.** R. T. Glascodine, assignor of ½ to George Spencer, Moulton & Co., Ltd., both of London, England.
1,881,390. **Bumper.** A. C. Schmidt, Oakland, Calif.
1,881,485. **Valve.** A. R. Gilmore, St. Louis, Mo.
1,881,655. **Tire.** B. S. Katz, Brooklyn, N. Y.
1,881,800. **Propeller Shaft Bearing.** A. F. Masury, New York, N. Y., assignor to Rubber Shock Insulator Corp., Wilmington, Del.
1,881,817. **Freezing Mold.** E. R. Meyer, assignor to Meyer-Blanke Co., both of St. Louis, Mo.
1,881,929. **Water Dispenser Valve.** F. M. Pottenger, Jr., Monrovia, Calif.
1,881,958. **Joint.** R. F. Peo, assignor to Houde Engineering Corp., both of Buffalo, N. Y.
1,881,991. **Golf Stroke Practicing Device.** L. E. Yaggi, E. Cleveland, O.
1,882,034. **Jointed Figure Toy.** J. K. Raugstad, Chicago, Ill.
1,882,129. **Tire Casing Inner Liner.** S. R. Fetner, Jacksonville, Fla.
1,882,209. **Freezing Unit.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.

1,882,215. **Tire Inflating Nozzle.** A. A. Ewald, assignor to Romort Mfg. Co., both of Oakfield, Wis.

1,882,291. **Fly Swatter.** S. G. Monroe and F. Shepherd, both of Akron, O.

1,882,455. **Dual Tire Pressure Equalizer.** D. H. Spicer, Lakewood, assignor to Spicer Airflater, Inc., Cleveland, both in O.

1,882,461. **Hatter's Fur Carroting Machine.** J. Weber and J. F. Tomaino, both of Danbury, Conn.

1,882,484. **Vehicle Independent Front Wheel.** M. H. Carpenter, New Rochelle, and C. B. Kirkham, Freeport, both in N. Y.

1,882,498. **Tire Tread.** F. J. Jarvis, assignor to Jarvis & Jarvis, Inc., both of Palmer, Mass.

1,882,661. **Tire Pressure Alarm.** G. G. Guthrie, Tulsa, Okla.

1,882,856. **Conductor Cord Strain Reliever.** G. J. Meuer, assignor to Cutler-Hammer, Inc., both of Milwaukee, Wis.

1,883,020. **Ball and Socket Joint.** A. B. Shultz, assignor to Houde Engineering Corp., both of Buffalo, N. Y.

1,883,040. **Deflated Tire Signal Warner.** A. B. Solve, Oakland, Calif.

1,883,041. **Clamp.** E. X. Somers, W. Barnet, Vt.

1,883,086. **Pipe and Coupling.** A. W. Swartz, Haverford, assignor to Linear Packing & Rubber Co., Inc., Tacony, both in Pa.

1,883,117. **Floor Covering.** W. J. Tompkins, Mt. Vernon, assignor to Western Electric Co., Inc., New York, both in N. Y.

1,883,128. **Snap Switch.** W. C. Tregoning, Wauwatosa, assignor to Cutler-Hammer, Inc., Milwaukee, both in Wis.

1,883,184, 1,883,185, and 1,883,187. **Marking Roll.** H. G. Weber, Sheboygan, Wis.

1,883,203. **Joint.** I. P. Whitehouse, assignor to H. C. Lord, both of Erie, Pa.

1,883,495. **Garter Top Stocking.** E. J. Berger, Hatfield, assignor to Dexdale Hosiery Mills, Lansdale, both in Pa.

1,883,584. **Interproximal Compact.** F. H. Connor, Duluth, Minn.

1,883,737. **Mat.** J. F. Duffy, assignor to Duffy Mfg. Co., both of Holland, Mich.

1,883,791. **Sign.** H. D. Jewell, Detroit, Mich.

1,883,938. **Package and Container.** D. H. Killeffer, Yonkers, assignor to Dryice Equipment Corp., New York, both in N. Y.

1,883,941. **Refrigerating Apparatus.** D. H. Killeffer, Yonkers, assignor to Dryice Equipment Corp., New York, both in N. Y.

1,883,994. **Step Plate.** R. K. Lee, assignor to Chrysler Corp., both of Detroit, Mich.

1,884,064 and 1,884,065. **Pipe Joint.** J. R. McWane, assignor to McWane Cast Iron Pipe Co., both of Birmingham, Ala.

1,884,216. **Paving Block.** J. F. Purdy, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,884,310. **Hose Supporter.** J. N. Sime, Chicago, Ill.

1,884,330. **Tire Antiskid Device.** G. Stabili, Morrisville, Pa.

1,884,374. **Leak Preventer.** J. W. Tatter, assignor to Lewis Differential Co., both of Chicago, Ill.

1,884,415. **Automobile Floor Board.** W. S. Vrooman, assignor to Paine & Williams Co., both of Cleveland, O.

1,884,432. **Electric Cord Terminal.** N. H. Watts, Alameda, Calif., assignor, by mesne assignments, to General Electric Co., Schenectady, N. Y.

1,884,521. **Railway Draft Rigging.** D. S. Barrows, Rochester, assignor to Symington Co., New York, both in N. Y.

1,884,705. **Pneumatic Boat.** W. E. Huffman, Dayton, O.

1,884,725. **Pneumatic Cushion Heel.** J. C. Keller, assignor to Keller Pneumatic Footwear Co., both of Chicago, Ill.

1,884,921. **Shoe Part Conditioning Device.** F. E. Toothaker, Swampscott, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,885,007 and 1,885,008. **Surgical Wrapping.** S. Rosenblatt, Brighton, assignor to Surgical Dressings, Inc., Boston, both in Mass.

Reissue

18,618. **Pneumatic Tire.** F. A. Krusemark, Chicago, Ill., assignor, by mesne assignments, to Lambert Tire & Rubber Co., a corp. of O.

18,638. **Railway Vehicle Tire.** A. J. Michelin, deceased, Paris, by M. J. J. Michelin, executor, assignor to Michelin & Cie., both of Clermont-Ferrand, all in France.

Dominion of Canada

326,039. **Multi-Core Cable.** Western Electric Co., Inc., New York, N. Y., assignee of O. E. Buckley, Maplewood, N. J., both in the U. S. A., and F. S. Malm, Nordenham, Germany, co-inventors.

326,065. **Submergible Electric Cable.** A. Arutunoff, Tulsa, Okla., U. S. A.

326,098. **Vehicle Engine Mounting.** H. C. Lord, Erie, Pa., U. S. A.

326,183. **Electric Cable.** General Cable Corp., New York, N. Y., assignee of R. W. Atkinson, Perth Amboy, N. J., both in the U. S. A.

326,267. **Seat Cushion.** E. F. Becher, Buffalo, N. Y., U. S. A.

326,279. **Brake Lining.** H. B. Denman, Pontiac, Mich., U. S. A.

326,482. **Resilient Floor.** D. B. Martyn, Victoria, B. C.

326,639. **Resilient Joint.** M. Houdaille and C. Lecler, co-inventors, both of Levallois-Perret, Seine, France.

326,794. **Heel Base.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of J. B. Hadaway, Swampscott, Mass., U. S. A.

326,889. **Nipple.** J. Schmid, New York, N. Y., U. S. A.

United Kingdom

373,666. **Watercraft Propulsion Resistance.** H. Scott-Paine, of British Power Boat Co., Southampton.

373,962. **Pneumatic Tire.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

374,046. **Stuffing Box Substitute.** G. G. Rover, Paris, France.

374,088. **Boat Fender.** H. Scott-Paine, of British Power Boat Co., Southampton.

374,201. **Bicycle Handle.** Dunlop Rubber Co., Ltd., London, and E. W. R. Matthews, of Dunlop Rubber Co., Ft. Dunlop.

374,317. **Billiard Table.** J. Robinson, Middlesex.

374,330. **Faucet Splash Preventer.** W. R. Cleaver, Warwickshire.

374,512. **Kneeling Mat.** C. Ouzman, London.

374,592. **Wringer Roller.** S. B. Woolf, London.

374,715. **Screw Driver.** J. W. and W. G. Ibberson, (trading as G. Ibberson & Co.), both of Sheffield.

374,742. **Tire Valve.** A. Schrader's Son, Inc., Brooklyn, assignee of S. T. Williams, Bellerose, both in N. Y., U. S. A.

374,773. **Manifold Writing Book.** Lamson Paragon Supply Co., Ltd., and J. F. Turnpenny, both of London.

374,819. **Railway Resilient Wheel.** L. Bacqueyrisse, Paris, France.

374,990. **Lamp Shade.** S. Aki and G. Koizumi, both of London.

375,074. **Footwear Stud.** W. H. Bird, Wanganui, New Zealand.

375,652. **Elastic Bandage.** E. Lormes (geb. Szonn), Berlin, Germany.

375,688. **Elastic Fabric.** C. P. Müller Ges., Wuppertal, Germany.

375,696. **Fishing Lead.** Hardy Bros. (Alnwick), Ltd., Northumberland, and C. Harris, Glamorgan.

375,699. **Stocking.** Hemphill Co., Central Falls, assignee of R. H. Lawson, Pawtucket, both in R. I., U. S. A.

375,880. **Vehicle Life Guard.** A. E. Farwell, Dorset.

375,954. **Buffer.** G. De Havilland and De Havilland Aircraft Co., Ltd., both of Middlesex.

375,993. **Vehicle Floor.** E. W. Head, London, and Federated Engineers, Ltd., Westminster.

376,024. **Hot Water Bottle Handle.** Leyland & Birmingham Rubber Co., Ltd., and H. J. Butcher, both of Leyland, Lancashire.

376,079. **Wash Cloth and Sponge.** R. Stewart, Ozone Park, N. Y., U. S. A.

Germany

560,175. **Tire Valve Cap.** Continental Gummi-Werke, A.G., Hannover.

561,127. **Block Belt.** K. Scheitinger, Berlin-Steglitz.

562,327. **Hot Water Bottle Reenforcement.** Munden-Hildesheimer Gummiwaaren-Fabriken Gebr. Wetzell, A.G., Hildesheim.

TRADE MARKS

United States

297,026. Representation of a sword and a shield and the word: **"Health-Gard."** Rubber sundries. J. Stein, doing business as Climax Rubber Co., New York, N. Y.

297,092. Ellipse containing the word: **"Amerclad."** Electric cord. American Steel & Wire Co. of N. J., Cleveland, O.

297,144. Label bearing the representation of a pirate and 2 sailing vessels and the words: **"Nurex Stik-Um. The New King of Adhesives."** Adhesive. Lee Hardware Co., Salina, Kan.

297,148. Representation of a glove and the word: **"Cufflex."** Glove cuff material. Landers Corp., Toledo, O.

297,229. Label bearing the words: **"Electroblacks, Products, Trade Mark, Electroblacks, Inc., Culver City, Calif."** Carbon black. Electroblacks, Inc., Culver City, Calif.

297,329. **Regal.** Golf balls. A. W. Morgan, Yonkers, N. Y.

297,330. **Tungsten.** Golf balls. A. W. Morgan, Yonkers, N. Y.

297,366. **Notop.** Golf balls. L. F. Rosenberg, Providence, R. I.

297,374. **Okon.** Plastic or moldable material. American Hard Rubber Co., Hempstead, N. Y.

297,503. **Kellermann.** Bathing shoes and caps. Asbury Mills, New York, N. Y.

Market Reviews

CRUDE RUBBER

THE rubber market has again fallen into a narrow rut. Prices are bumping along at rock bottom; transactions are few so that speculators can manipulate the market on occasion; and the statistical position shows nothing radically new. The few gains that were recorded were soon canceled, and at the end of the month prices were slightly lower than at the beginning.

Despite indications that production of crude rubber is gradually being lowered. United States stocks have continued to increase until they now total 373,823 tons as of October 31. Last year the figure was 273,456 tons on the same date.

Abnormally low consumption is the reason for the increase. In October manufacturers took only 21,018 tons against arrivals of 35,473 tons. The automobile situation is the answer, of course, to the low consumption rate.

That production is decreasing somewhat is shown by figures for output in Malaya for the first 10 months of this year. At 398,061 tons, they compare with the 435,987 tons produced in the same period last year. Dutch East Indies and Ceylon shipments show a similar trend, and the low prices should extend the movement.

A cabled report recently stated that the Malaya Estates Owners Association called a conference for representatives of the 3 producing countries to discuss rubber control, but traders paid little attention to the report since the government in the Indies is on record as against any such action.

With October automobile output at 50,270 units, the industry reached the lowest level in 14 years. Total production for 1932 is put 40% below the low rate in 1931. Tire manufacturers report a similar lack of demand.

During November, however, and probably in December too the output of automobiles has been sharply accelerated. The 3 low-price cars are accounting for the increase as plans for new models are being pushed. First Chrysler swung into production, with a statement that something like $42,000,000 would be spent in 6 months. Next General Motors stepped into the picture, expecting to put out 50,000 cars before the end of the year; and all kinds of rumors surround Ford plans.

Since the winter is a normally dull season, the index of production is going to rise markedly. The question is, however, how many of these cars will be sold. Commentators point out, with truth, that people are not buying because they haven't the money. As cheering to the rubber industry as the activity in automobiles is, conservative traders will wait until the sales figures are published before they hail it as a real advance.

RUBBER BEAR POINTS

1. November shipments from Malaya are put at 39,500 to 40,000 tons, against 37,931 tons in October. This estimate, however, is below last year's figure.
2. Consumption of crude rubber in October was 21,018 tons against 22,491 in September. Imports were 35,473 tons.
3. Domestic stocks of crude rubber were 373,823 long tons on October 31 against 365,789 on September 30, and 273,456 on October 31, 1931.
4. New passenger car registrations for October reached a new low record.
5. October automobile production was 50,270 units, the lowest since November, 1918.
6. Shipments of pneumatic casings in September were 21.6% below September last year; production was down 20.0%.
7. Dealers' stocks of crude rubber in the Far East were 26,270 tons on October 31, against 23,622 on September 30.
8. For October Far East production on estates was 3,300 above the rate in September.

RUBBER BULL POINTS

1. Crude rubber afloat for the United States on October 31 was 40,176 long tons against 46,188 on September 30 and 51,320 on October 31, 1931.
2. London and Liverpool stocks on November 19 were 97,573 long tons against 130,661 on the same date last year.
3. Stocks of pneumatic casings on September 30 were 6,096,098 units against 6,658,974 on August 30 and 8,158,453 on September 30, 1931.
4. Ceylon shipments in October were 1,877 tons, compared with 3,003 in September.
5. October Malayan shipments were 37,931 tons, against 41,973 in September and 45,911 in October, 1931.

In the Outside Market the same dull tone prevailed as on the Exchange. At first it was thought improvement would be shown after the election, but it was not. Prices fluctuated only fractionally, resisting lower levels because dealers cannot make money at the present quotations. Toward the end of November the war debts created a feeling of uncertainty, and with Congress convening on December 5, further hesitation will probably be experienced until its policies are clarified. Business must gather momentum before a gain will be felt in all industries.

With local support and encouraged by firm cables from primary centers, the rubber market quietly advanced from 17 to 21 points for the last week of October. Even when wheat reached a new all-time low and cotton sold off, rubber held its own. The largest number of transactions were made in the Saturday half-session when 1,060 tons changed hands.

The November position closed at 3.53¢ against 3.32¢ the week before; December 3.56 against 3.36; January 3.62 against 3.43; March 3.74 against 3.55; May 3.81 against 3.62; and July 3.86 against 3.69.

Symington & Wilson, a London rubber house, published an interesting study in a recent report, which analyzed production of native rubber in Dutch East Indies for the first half of the last 4 years. In the first half of 1929 native production in this district was 54,976 tons, while the average price in London was 10.91d; in 1930 production was 51,703 tons, the London price averaged 7.23d; in 1931 production was 46,711 tons, the average price 3.47d; and in 1932 production for the first half was 26,555 tons, and the average price 2.23d. This picture is certainly encouraging as far as native production goes, but from recent statistics it appears that estate production is still high.

Shipments from Dutch East Indies for September totaled 18,296 tons against 17,199 tons in August and 21,667 tons in September, 1931. In British Malaya production on large and small estates in September was 33,315 tons against 36,408 in August and 36,833 in September, 1931. Dealers' stocks at that point were 21,611 tons at the end of the month against 22,356 tons in August; estate stocks were 18,515 tons against 19,618 on the 2 dates.

Another report was published by Lamborn, Hutchings & Co. of New York. Analyzing automobile production by 13 of the leading companies for the first 9 months of this year, and comparing it with last year, the firm estimated that 1932 output will be about 1,400,000 units, or 40% below the 2,459,563 produced in 1931. So far this year about 1,200,000 units have been produced. The standing of the various companies was as follows: General Motors produced 39.6% of this year's output; Ford 29.6%; and Chrysler 15.1%.

Outside Market prices were up a fraction for the week, but business was characterized as "very quiet." It will probably continue to be that for the next couple of weeks, perhaps longer. The automobile trade is at present operating at its lowest rate in a long time; other lines are hesitant to go ahead before they know what course business will take following the election.

November-December positions sold at 3 5/8¢, compared with 3 1/16¢ the week before; January-March 3¾ against 3 5/8; April-June 3⅞ against 3 13/16; and July-September 4 unchanged.

Week ended November 5. Paced by the stock and commodity markets, rubber prices lost ground for most of the week, but recovered on Friday and Saturday to end firm. The principal news items were the lower shipments from Ceylon, steady reduction of British stocks, and lower shipments from Malaya.

Price changes showed losses of from 7 to 16 points. The November contract closed at 3.39¢ compared with 3.53¢ last week; December 3.42 against 3.56; January 3.48 against 3.62; March 3.60 against 3.74; May 3.65 against 3.81; July 3.73 against 3.86; September 3.86 against 3.93.

Malayan shipments during October totaled 37,931 tons against 41,973 tons exported in September and 45,911 tons

shipped during October, 1931. For the 10 months ending October the figure is 398,046 tons against 435,987 tons for the same period last year.

American shipments from the October Malay figures were 21,042 tons, compared with 22,387 tons received in September, and 32,872 in October, 1931. For 10 months we received 233,895 tons this year against 287,248 last year. Eliminating reshipments, the Malayan exports for October amount to only 28,133 tons, the smallest of the year.

The same report also stated that so far this year Japan has taken 32,483 tons of rubber against 26,247 tons in 1931 and 21,563 in the 10 months of 1930.

The meeting mentioned above was called by the Malaya Estates Owners Association, inviting the rubber interests of the Dutch East Indies to a triangular conference of proprietary interests of Malaya, Dutch East Indies, and Ceylon to discuss the question of rubber control. As far as could be learned, the trade does not take this gesture seriously. Speculators might trade on it a bit, but the futile attempts of last year to call a restriction meeting and get action are still fresh in the memory of most traders, and before the present effort will receive credence more definite news must be forthcoming.

Outside Market prices were down only 1/16 for the week. Business was very quiet, with most buyers holding off until they know what happens next Tuesday. Nearbys sold at 3 1/16¢ against 3 5/8¢ last week; January-March 3 1/8 against 3 3/4; April-June 3 1/8 against 3 7/8; and July-September 3 1/8 against 4.

Week ended November 12. With the Election Day holiday interfering, and the holiday spirit on Friday, Armistice Day, the rubber market showed little action for the week. Transactions reached a minimum on Saturday when only 120 long tons exchanged hands. Price changes were principally in response to fluctuations on the stock and commodity markets.

Gains ranged from 4 to 12 points. November sold at 3.46¢ on Saturday, compared with 3.39¢ last week; December 3.46 against 3.42; January 3.54 against 3.48; March 3.69 against 3.60; May 3.75 against 3.65; and July 3.85 against 3.73.

British stocks, decreasing steadily for the last few weeks, on November 5 totaled 99,425 tons against 132,607 tons on the same date last year, a drop of about 25%.

The extremely low rate of automobile production is making itself felt in the tire industry since replacement demand is not up to its normal rate, but manufacturers generally are optimistic for the future.

A drop in output is also shown by results of 615 estates as shown by the Rubber Growers' Association. For the first 9 months of 1932, production on these estates was 187,254 tons, against 192,785 tons in 1931, and 190,270 in 1930.

Dutch East Indies figures for the first 9 months were 154,172 tons this year against 188,067 tons last year. Native exports in this period dropped 34%, and estate exports only about 9%. Although these figures show a trend toward lessened production, they can hardly be considered as definitely showing that the production problem has been solved. Estates have maintained their output at fairly high levels, and what it would be if prices improved is not hard to guess.

The fraction in price that the Outside Market lost last week was regained this week; so prices were where they had been 2 weeks ago. The market was very quiet with one official holiday and another partially observed.

November-December positions were quoted at 3 5/8¢ on ribbed smoked sheets, compared with 3 1/16¢ the week before; January-March 3 1/4 against 3 1/8; April-June 3 7/8 against 3 1/8; July-September 4 against 3 1/8.

Week ended November 19. Except for Monday, business on the Exchange was of a greater volume than in the last few weeks, but a large portion of the business represented switching operations on differences in the quotations of the December and July contracts. Statistical news appearing on the market was disappointing; so the losses of from 14 to 17 points for the period were not so bad as they might have been.

The November contract sold at 3.32¢ at the close, compared with 3.46¢ the week before; December 3.32 against 3.46; January 3.39 against 3.54; March 3.52 against 3.69; May 3.58 against 3.75; and July 3.68 against 3.85.

October consumption of crude rubber by United States manufacturers was 21,018 long tons, compared with 22,491 long tons for September, 1932, a drop of 6.5%. Imports during the month were 35,473 long tons, an increase of 20.2% over those of September, 1932, but 14.3% less than during October, 1931.

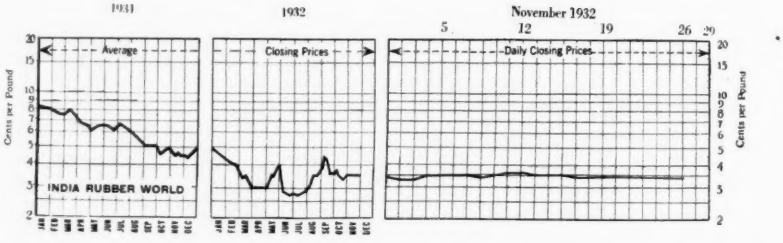
Stocks on hand showed a discouraging increase. On October 31 they totaled 373,823 long tons, an increase of 2.2% over the September 30 total of 365,789 and 36.7% over the October 31, 1931, stocks. Crude rubber afloat for this country on October 31 was 40,176 tons, against 46,188 tons on September 30, 1932, and 51,320 tons on October 31, 1931.

With consumption sliding off, private estimates put Malaya shipments for November at 39,500 tons, compared with shipments of 37,931 tons in October and 48,012 shipped in November last year. The drop from last year is welcome, but the increasing stocks on hand show that the present rate of output is still too great.

September figures on pneumatic casings show that shipments were 3,082,285 casings, an increase of 16.1% over August, but 21.6% less than in September, 1931. Production was only 2,538,720 casings, a drop of 17.8% under August this year and 20.0% less than September, 1931. Manufacturers held 6,096,098 units on September 30, a decrease of 8.5% below August 31, 1932, and 25.3% less than September 30, 1931, stocks.

Outside Market prices slid lower in a market where business was conspicuous by its absence. The small amount of trading done was unsatisfactory, since no money can be made at the low prices now prevailing.

Standard ribbed smoked sheets were quoted as follows: November-December 3 7/16¢ against 3 5/8¢; January-March 3 1/16 against 3 1/4; April-June 3 1/8 against 3 7/8; July-September 3 1/8 against 4; and October-December 3 1/8 against 4 1/16.



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	October, 1932							November, 1932														
	24	25	26	27	28	29	31	1	2	3	4	5	7	8*	9	10	11	12	14	15	16	17	18	19
Ribbed Smoked Sheet	3 3/16	3 1/2	3 1/2	3 1/2	3 5/16	3 5/16	3 1/2	3 7/16	3 3/8	3 3/8	3 1/2	3 1/2	3 1/2	...	3 7/16	3 1/2	3 5/16	3 5/16	3 1/2	3 1/2	3 1/2	3 7/16	3 7/16	3 7/16
No. 1 Thin Latex Crepe	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4	3 15/16	3 15/16	4 1/16	4 1/16	4 1/16	...	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4	4	4
No. 1 Thick Latex Crepe	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4	3 15/16	3 15/16	4 1/16	4 1/16	4 1/16	...	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4	4	4
No. 1 Brown Crepe	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 2 Brown Crepe	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3	3	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 2 Amber	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 3 Amber	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3	3	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 4 Amber	2 15/16	3	3	3	3 1/16	3 1/16	3	2 13/16	2 15/16	2 15/16	3	3	3	...	2 13/16	3	3 1/16	3 1/16	3	3	3	2 13/16	2 13/16	2 13/16
Rolled Brown	2 13/16	2 13/16	2 13/16	2 13/16	2 15/16	2 15/16	2 13/16	2 15/16	2 15/16	2 15/16	2 13/16	2 13/16	2 13/16	...	2 15/16	2 13/16	2 3/4	2 3/4	2 13/16	2 13/16	2 13/16	2 15/16	2 15/16	2 15/16

*Holiday.

Week ended November 26. Switching operations preceding the Thanksgiving holiday stepped up the volume of transactions, but actual sales were small. For the 3 days transactions totaled 3,800 long tons. The largest loss was on Wednesday when in sympathy with stocks and commodities and political news from Washington prices were lower by 2 to 6 points.

At the close on Saturday prices were: December 3.27 against 3.32; January 3.34 against 3.39; March 3.46 against 3.52; May 3.52 against 3.58; and July 3.62 against 3.68.

Last month's production in the Far East, according to the census figures, was 3,300 tons greater than the month before.

The automobile index of the *Times* showed another increase for the November 19 week, standing at 30.3 against 20.5 for the preceding week and 17.8 for the same week last year. The increase was largely due to expansion by Plymouth, with a slight acceleration of Ford assemblies. Chevrolet will soon start active production; so the index will probably go even higher.

On Friday and Saturday crude rubber in all positions was dull, and the price of spot ribbed smoked sheets held steady at 3⅜¢.

The Outside Market was characterized as exceptionally dull for this period. Factory interest was limited to small takings for immediate requirements.

Quotations were only fractionally changed from last Saturday's prices. January-March closed at 3½¢ against 3 9/16; and April-June 3⅝ against 3 11/16.

Crude rubber purchasing by manufacturers is limited closely to current needs. Declines in the market price serve to stimulate factory interest. Actual spot smoked sheet was steady at 3¼¢ to 3⅜¢ on Friday and Saturday.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Pfd.	$3.00 s. a.	Dec. 15	Dec. 1
Firestone Tire & Rubber Co.	Pfd.	$1.50 q.	Dec. 1	Nov. 15
Gates Rubber Co.	Pfd.	$1.75 q.	Dec. 1	Nov. 15
Goodyear Tire & Rubber Co.	$7 Pfd.	$1.75 q.	Jan. 1	Dec. 1
Raybestos-Manhattan, Inc.	Com.	$0.15 q.	Dec. 15	Nov. 30
Tyer Rubber Co.	6% Pfd.	$1.50 q.	Nov. 15	Nov. 10

New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	Nov. 24, 1931	Oct. 26, 1932	Nov. 26, 1932
Rubber latex...*gal.*	69	51	51
Sheet			
Ribbed, smoked, spot	4 3/16/4 5/16	3½/3 5/16	3 7/16
Nov.-Dec.	4 3/16/4 5/16	3½/3 5/16	3 7/16
Jan.-Mar.	4¾	3 11/16/3¾	3 9/16
Apr.-June	4⅞	3¾/3⅞	3 11/16
Crepe			
No. 1 thin latex, spot	4 11/16/5 1/16	4⅛/4¼	4⅛
Nov.-Dec.	4 11/16/5 1/16	4⅛/4¼	4⅛
Jan.-Mar.	5 1/16/5 3/16	4¼/4 5/16	4¼
Apr.-June	5 3/16/5⅜	4⅜/4½	4⅜
No. 2 Amber, spot	4⅜	3¼/3 7/16	3⅜
Nov.-Dec.	4⅜	3¼/3 7/16	3⅜
Jan.-Mar.	4½/4 9/16	3⅜/3½	3¼
Apr.-June	4 5/8/4 11/16	3½/3 5/8	3⅜
No. 3 Amber, spot	4¼/4 5/16	3 3/16/3¼	3 1/16
No. 1 Brown	4⅜/4½	3¼	3 1/16
No. 2 Brown	4¼/4 5/16	3 5/16	3
Brown, rolled	4 /4⅛	2⅞/3	2¾
Paras			
Upriver fine	5¾	7¼	7
Upriver fine	*9½	*10¼	*9¾
Upriver coarse	†3½	†3½	3
Upriver coarse	*5	*4¾	*5¼
Islands fine	12	†6½	6⅞
Islands fine	*15	*10	*9¾
Acre, Bolivian, fine	13	7½	7⅛
Acre, Bolivian, fine	*16	*10½	*10
Beni, Bolivian	13⅛	7½	7¼
Madeira, fine	12¾	7¾	7
Pontianak			
Bandjermasin	6	5	5
Pressed block	9	6¾	6½
Sarawak	6	5	5

Caucho	Nov. 24, 1931	Oct. 26, 1932	Nov. 26, 1932
Upper ball	7¾	†3½	3
Upper ball	*10½	*4¾	*5¼
Lower ball	7	†3	2½
Manicobas			
Manicoba, 30% guar.	..	†2½	†2½
Mangabiera, thin sheet	..	....	....
Guayule			
Duro, washed and dried	15	12	12
Ampar	16	13	13
Africans			
Rio Nuñez	..	3¾	3¾
Black Kassai	..	6½	6½
Manihot cuttings	..	3½	3½
Prime Niger flake	..	15	15
Gutta Percha			
Gutta Siak	13½	6¾	6½
Gutta Soh	29	14	13
Red Macassar	..	1.25	1.50
Balata			
Block, Ciudad Bolivar	32	16	17
Manaos block	37	16	17
Surinam sheets	57	26	25
Amber	60	29	26

*Washed and dried crepe. Shipments from Brazil. †Nominal.

Plantation Rubber Crop Returns by Months

Summary of 615 Producing Companies

1932	Br. N. Borneo (26 Companies) Long Tons	Br. N. Borneo Index	Ceylon (102 Companies) Long Tons	Ceylon Index	India and Burma (21 Companies) Long Tons	India and Burma Index	Malaya (338 Companies) Long Tons	Malaya Index	Netherlands East Indies: Java (60 Companies) Long Tons	Java Index	Netherlands East Indies: Sumatra (60 Companies) Long Tons	Sumatra Index	Miscellaneous (8 Companies) Long Tons	Miscellaneous Index	Total (615 Companies) Long Tons	Total Index
January	352	72.0	1,378	67.5	208	37.0	14,409	115.9	2,791	106.3	4,712	116.9	212	117.1	24,062	107.6
February	336	68.7	738	36.2	82	14.6	11,854	95.3	2,793	106.4	3,894	96.6	120	66.3	19,817	88.6
March	365	74.6	1,187	58.2	152	27.0	11,355	91.3	3,071	116.9	4,210	104.4	143	79.0	20,483	91.6
April	318	65.0	1,209	59.2	149	26.5	11,991	96.4	2,762	105.2	4,046	100.3	163	90.1	20,638	92.3
May	277	56.6	897	43.9	99	17.6	12,711	102.2	2,541	96.8	4,364	108.2	171	94.5	21,060	94.2
June	298	60.9	1,196	58.6	36	6.4	12,353	99.3	2,323	88.5	4,263	105.7	167	92.3	20,636	92.3
July	308	63.0	1,224	60.0	16	2.8	13,069	105.1	2,237	85.2	4,173	103.5	140	77.3	21,167	94.7
August	302	61.8	987	48.4	19	3.4	12,838	103.2	1,750	66.6	4,075	101.1	124	68.5	20,095	89.9
September	286	58.5	1,092	53.5	54	9.6	11,742	94.4	1,627	62.0	4,387	108.8	108	59.7	19,296	86.3
Nine months ending September,																
1932	2,842	....	9,908	....	815	....	112,322	....	21,895	....	38,124	....	1,348	....	187,254	....
1931	3,571	....	11,586	....	3,274	....	108,866	....	25,923	....	37,796	....	1,769	....	192,785	....

NOTE. Index figures throughout are based on the monthly average for 1929=100. Issued October 25, 1932, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

New York Outside Market (Continued)

	November, 1932: 21	22	23	24*	25	26
Ribbed Smoked Sheet	3 7/16	3 7/16	3 7/16	...	3⅜	3⅜
No. 1 Thin Latex Crepe	4	4	4	...	3 11/16	3 11/16
No. 1 Thick Latex Crepe	4	4	4	...	3 11/16	3 11/16
No. 1 Brown Crepe	3⅛	3⅛	3⅛	...	3 1/16	3 1/16
No. 2 Brown Crepe	3 1/16	3 1/16	3 1/16	...	3	3
No. 2 Amber	3⅛	3⅛	3⅛	...	3 1/16	3 1/16
No. 3 Amber	3 1/16	3 1/16	3 1/16	...	3	3
No. 4 Amber	2 11/16	2 11/16	2 11/16	...	2 7/16	2 7/16
Rolled Brown	2 5/8	2 5/8	2 5/8	...	2 9/16	2 9/16

*Holiday.

Low and High New York Spot Prices in Cents per Pound

	November: 1932*	1931	1930
PLANTATIONS			
Thin latex crepe	3 11/16/4 1/16	4 5/16/5 3/16	8 5/16/ 9¾
Smoked sheet, ribbed	3¼/3 7/16	4 3/16/5	8¼/ 9½
PARAS			
Upriver fine	7¼/7½	5¾/6¼	12¼/12½

*Figured to November 26, 1932.

COMPOUNDING INGREDIENTS

RUBBER goods manufacturing seems not to have been altered by the result of the recent national election. In all lines output is on a greatly curtailed basis as compared with normal capacity. Footwear and weatherproofed clothing are among the more active divisions because of seasonal demand for these goods.

Compounding ingredients are moving slowly but steadily into consumption in a hand-to-mouth way. No changes in price quotations of rubber ingredients were noted in November.

Supplies of carbon black, lithopone, and zinc oxide are reported contracted for at the current low levels for the first half of 1933.

A leading producer of popular rubber chemicals and colors has revised and consolidated its list of accelerators in accordance with the following changes. Grasselerator 808 and 833 will be known hereafter as du Pont 808 and 833, respectively. Hydrone is renamed Tepidone. The following accelerators have been discontinued: R & H 50; No. 397; Tensilac 39; Thermlo F; and T.M.T.T.

New York Quotations

November 26, 1932

Prices Not Reported Will Be Supplied on Application

Abrasives

Pumicestone, pwd.	lb.	$0.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00

Accelerators, Inorganic

Lime, hydrated	ton	
Litharge, com., pwd., casks	lb.	.05¾
Magnesia, calcined, heavy	lb.	
carbonate	lb.	.05¾/ .06

Accelerators, Organic

Accelerator 49	lb.	.38 / .48
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Barak	lb.	
BLE	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.42 / .52
DPG	lb.	.33 / .43
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	.45 / .47½
Formaldehyde aniline	lb.	.37½/ .40
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.46
Lead oleate, No. 999	lb.	.10
Witco	lb.	
Lithex	lb.	
Methylene dianiline	lb.	
Monex	lb.	
Novex	lb.	
Plastone	lb.	
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thiocarbanilid	lb.	.25 / .27
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Vulcanex	lb.	
ZBX	lb.	
Zimate	lb.	

Acids

Acetic 28% (bbls.)	100 lbs.	2.65 / 2.90
glacial (carboys)	100 lbs.	9.64 / 9.89
Sulphuric, 66°	ton	15.50

Age Resisters

Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
Neozone	lb.	
Permalux	lb.	
VGB	lb.	
Zalba	lb.	

Antiscorch Materials

UTB	lb.	

Antisun Materials

Heliozone	lb.	
Sunproof	lb.	

Binders, Fibrous

Cotton flock, dark	lb.	.09 / .11½
dyed	lb.	.50
white	lb.	.11 / .15
Rayon flock, white	lb.	1.40
colored	lb.	1.75

Colors

BLACK

Bone, powdered	lb.	.05½/ .15
Drop	lb.	$0.05½/$0.17
Lampblack (commercial)	lb.	.06 / .08

BLUE

Blue toners	lb.	.80 / 3.50
Prussian	lb.	.35 / .37
Ultramarine	lb.	.07 / .10

BROWN

Mapico	lb.	.14 / .15
Sienna, Italian, raw, pwd.	lb.	.04½/ .11

GREEN

Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
oxide	lb.	.19 / .21
Green toners	lb.	.85 / 3.50

ORANGE

Cadmium sulphide	lb.	
Orange toners	lb.	.40 / 1.60

ORCHID

Orchid toners	lb.	1.50 / 2.00

PINK

Pink toners	lb.	1.50 / 4.00

PURPLE

Purple toners	lb.	.60 / 2.00

RED

Antimony		
Crimson, R. M. P. No. 3	lb.	.48
Sulphur free	lb.	.52
7-A	lb.	.35
Z-2	lb.	.20
Iron Oxides		
Rub-er-red	lb.	.08¾
Mapico	lb.	.08½/ .09
Red toners	lb.	.80 / 2.00

WHITE

Lithopone	lb.	.04½/ .05
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06 / .06¼
CB No. 21	lb.	.06 / .06¼
Grasselli	lb.	.04½/ .05
Titanium oxide, pure	lb.	.17 / .18½
Titanox "B"	lb.	.06 / .06½
"C"	lb.	.06 / .06½
Zinc Oxide		
Black label (lead free)	lb.	.05¾
F. P. Florence, green seal	lb.	.09⅝/ .09⅞
red seal	lb.	.08⅝/ .08⅞
white seal (bbls.)	lb.	.10⅞
Green label (lead free)	lb.	.05¾
Green seal, Anaconda	lb.	.09⅝/ .10⅛
Horsehead (lead free) brand		
Selected	lb.	.05¾/ .06
Special	lb.	.05¾/ .06
XX	lb.	.05¾/ .06
green	lb.	.05¾/ .06
red	lb.	.05¾/ .06
Kadox, black label	lb.	.09⅝/ .09⅞
blue label	lb.	.08⅝/ .08⅞
red label	lb.	.07¼/ .07½
Lehigh (leaded)	lb.	.0490/ .0515
Red label (lead free)	lb.	.05¾
Red seal, Anaconda	lb.	.08⅝/ .09⅛
Standard (leaded)	lb.	.05½/ .05¾
Sterling (leaded)	lb.	.05½/ .05¾
Superior (leaded)	lb.	.05½/ .05¾
U. S. P. (bbls.)	lb.	.12¾
White seal, Anaconda	lb.	.10⅞/ .11⅛
XX zinc sulphide (bbls.)	lb.	.13

YELLOW

Chrome	lb.	.15
Mapico	lb.	.11 / .12
Ochre, domestic	lb.	.01¾/ .02½
Yellow toners	lb.	2.50

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine	ton	
Barytes (f.o.b. St. Louis)	ton	23.00
Blanc fixe, dry, precip.	ton	70.00 /75.00
pulp	ton	$42.50/$45.00
Kalite No. 1	ton	
No. 3	ton	
Suprex white, extra light	ton	60.00 /80.00
heavy	ton	45.00 /55.00
Whiting		
Chalk, precipitated	lb.	.03½/ .04
Domestic	100 lbs.	1.00
Sussex	ton	
Witco	ton	

Fillers for Pliability

Flex	lb.	
Fumonex	lb.	.02½/ .06
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	.02 / .05

Finishes

Mica, amber	lb.	
Starch, corn, pwd	100 lbs.	2.29 / 2.49
Talc, dusting	ton	20.00
Pyrax A	ton	

Latex Compounding Ingredients

Accelerator 552.	lb.	
Aquarex	lb.	
Catalpo	ton	35.00 /60.00
Colloidal color pastes	lb.	
sulphur	lb.	
zinc oxide	lb.	
Collway sulphur (dry basis)	lb.	
Disinfectants	lb.	
Dispersed Antox	lb.	
Emulsified Heliozone	lb.	
Nekal BX (dry)	lb.	
Neozone L	lb.	
Tepidone	lb.	

Mineral Rubber

Genasco (fact'y)	ton	40.00 /42.00
Gilsonite (fact'y)	ton	37.14 /39.65
Granulated M. R.	ton	
Hydrocarbon, hard	ton	
Parmr Grade 1	ton	23.00 /28.00
Grade 2	ton	23.00 /28.00

Mold Lubricants

Sericite	lb.	
Soapbark (cut)	lb.	.06 / .06½
Soapstone	ton	15.00

Oils

Castor, blown	lb.	.11¼/ .11¾
Poppy seed oil	gal.	1.60
Red oil, distilled (bbls.)	lb.	.06⅝/ .07¼

Protective Colloids

Casein, domestic	lb.	.07 / .07½

Reenforcers

Aluminum flake	ton	
Carbon Black		
Aerfloted arrow black	lb	.02¾
Arrow specification black	lb.	.03
Century (works, c. l.)	lb.	
Certified, Cabot, c. l., f. o. b. works, bags	lb.	
c. l., f. o. b. works, cases	lb.	.04¼
l. c. l., f. o. b. works	lb.	.04¾
Disperso (works, c. l.)	lb.	
Dixie brand	lb.	.0272/ .06½
Elastex	lb.	.03½/ .08
Gastex (f. o. b. fact'y)	lb.	.02½/ .06
Kosmos brand	lb.	.0272/ .06½
Micronex	lb.	.03 / .05
Ordinary (compressed or uncompressed)	lb.	.02¾/ .07

Clays

Blue Ridge, dark	ton	
China	ton	7.50
Dixie	ton	
Langford	ton	
Par	ton	
Perfection	ton	8.00
Standard	ton	7.50

Suprex No. 1	ton	$8.00
No. 2, dark	ton	6.50
Glue, high grade	lb.	.15 /$0.22
Reodorant		
Rodo	lb.	
Rubber Substitutes or Factice		
Amberex	lb.	.14¾
Black	lb.	.06 / .08
Brown	lb.	.07 / .11
White	lb.	.07½ / .12
Softeners		
Burgundy pitch	lb.	
Degras	lb.	.02¾ / .03½
Palm oil (Witco)	lb.	
Petrolatum, light amber	lb.	.02½ / .02¾
Plastogen	lb.	
Rosin oil, compounded	gal.	
Rubtack	lb.	
Tonox	lb.	
Witco Flux	gal.	
Solvents		
Benzol (90% drums)	gal.	.25
Bondogen	gal.	
Carbon bisulphide (drums)	lb.	.05½ / .12
tetrachloride	lb.	.06¼ / .09
Dependip	gal.	
Dip-Sol	gal.	
Dryolene, No. 9	gal.	
Petrobenzol	gal.	
Rub-Sol	gal.	
Solvent naphtha 284	gal.	
Stod-Sol	gal.	
Troluoil	gal.	
Turpentine, steam distilled	gal.	.4032/ .45
Stabilizers for Cure		
Laurex, ton lots	lb.	
Stearex B	lb.	.07 / .09
flake	lb.	.06½ / .08
Stearic acid, dbl. pres'd	lb.	.08 / .12
Vulcanizing Ingredients		
Rubber sulphur	100 lbs.	1.85 / 2.00
Sulphur chloride, drums	lb.	.03½ / .04
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1537	Supplier of caoutchouc oil.
1538	Manufacturer of deodorizing chemicals.
1539	Source of supply of pimpled rubber sheeting.
1540	Supplier of holland cloth.
1541	Manufacturer of rubber tack bumpers.
1542	Manufacturer of hard rubber ink bottle tops.
1543	Manufacturer of an instrument for determining the specific gravity of rubber samples.
1544	Who in the United States wants to represent a German firm for tire bead wire?
1545	Information wanted regarding "Korbasite."
1546	Supplier of Leukanol.
1547	Manufacturer of rubber pad for protecting the knee and extending to the ankle.
1548	Manufacturer of rubber bumpers with metal inserts for backs of chairs.
1549	Manufacturer of corded diaphragm rubber sheet similar to rubberized cord tire fabric.
1550	Manufacturer of linemen's blankets.
1551	Manufacturer of rubber coasters.
1552	Manufacturer of hard rubber ink bottle caps.
1553	Manufacturer of rubber coated cloth.
1554	Manufacturer of rubber cement.
1555	Manufacturer of Fluxol.

Lithuania

A rubber footwear factory, to employ about 200 persons, is being constructed at Versciviai, a suburb of Kovno, in Lithuania, by the Riga concern, Gentleman, at a cost, including equipment, of 1,500,000 litai. (U. S. equivalent = $0.100.)

IMPORTS, CONSUMPTION, AND STOCKS

CONSUMPTION of crude rubber by manufacturers in the United States for October totaled 21,018 long tons, compared with 22,491 long tons for September, 1932, a decrease of 6.5% according to The Rubber Manufacturers Association.

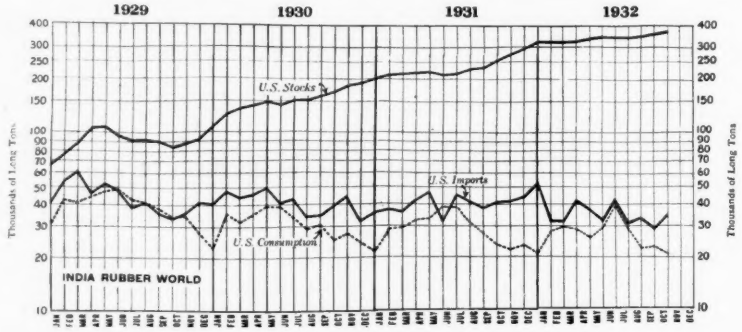
October imports of crude rubber were 35,473 long tons, an increase of 20.2% above September, 1932, but 14.3% below October, 1931.

Total domestic stocks of crude rubber on hand October 31 are estimated at 373,823 long tons, compared with September 30 stocks of 365,789. October stocks increased 2.2% as compared with September, 1932, and were 36.7% above the stocks of October 31, 1931.

There were 40,176 long tons of crude rubber afloat for the United States ports on October 31, compared with 46,188 long tons afloat on September 30, 1932, and 51,320 long tons afloat on October 31, 1931.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Oct. 29	42,614	57,702
Nov. 5	42,114	57,311
Nov. 12	41,528	57,329
Nov. 19	40,952	57,021
Nov. 26	41,025	56,004



United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1927	431,807	372,528	100,130	47,938	65,663	25,798	605,196	589,128	193,146
1928	446,421	442,227	66,166	68,764	22,691	32,905	649,674	667,027	122,828
1929	561,454	466,475	105,138	62,389	73,276	36,768	863,410	785,475	228,572
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,826	53,940	127,103	55,458	797,441	668,660	495,724
1932									
January	31,298	27,962	322,860	42,234	125,276	59,836	63,627	50,480	507,962
February	30,546	30,012	322,117	51,728	125,958	56,684	59,871	51,230	504,759
March	42,382	27,828	334,566	44,190	124,975	51,072	58,977	63,324	510,838
April	37,017	25,953	343,098	40,387	123,235	48,303	57,232	57,450	514,637
May	32,224	29,197	346,231	50,453	116,015	47,015	62,434	56,156	509,261
June	41,394	39,116	345,702	43,079	109,509	28,671	57,713	72,300	455,973
July	31,078	28,272	345,927	37,894	106,085	24,206	60,812	56,720	474,218
August	34,219	22,372	357,342	42,846	104,315	27,595	59,130	54,280	489,252
September	29,509	22,491	365,789	46,188	103,091	27,975	58,577	53,600	496,855
October	35,473	21,018	373,823	40,176	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

Imports by Customs Districts

	September, 1932 Rubber Latex Pounds	Rubber Latex Value	Crude Rubber Pounds	Crude Rubber Value	September, 1931 *Crude Rubber Pounds	*Crude Rubber Value
Massachusetts	441,194	$32,714	4,036,044	$110,932	4,263,995	$335,075
New York	160,413	10,500	48,079,823	1,359,399	70,097,623	4,017,646
Philadelphia	.....	.....	122,616	2,518	.....	.....
Maryland	.....	.....	5,820,341	144,625	6,832,407	366,241
Georgia	.....	.....	.....	.....	161,280	7,816
Mobile	.....	.....	2,565,892	62,593	1,507,864	68,002
Los Angeles	.....	.....	3,996,466	86,684	3,579,212	204,113
San Francisco	.....	.....	240,000	7,652	145,600	8,054
Oregon	.....	.....	.....	.....	13,440	903
Ohio	63,380	3,166	.....	.....	224	14
Colorado	.....	.....	.....	.....	607,400	34,903
Totals	664,987	$46,380	64,861,182	$1,774,403	87,209,045	$5,042,767

*Crude rubber including latex dry rubber content.

COTTON AND FABRICS

THE 1932 crop is now generally expected to be in the neighborhood of 12,000,000 bales. The last government estimate put the figure at 11,947,000 bales, 522,000 bales above their previous report. The latest ginnings figure, showing heavy ginnings for the last month, shows a total of 10,532,745 bales, thus substantiating predictions of a 12,000,000 bale crop.

But that statement doesn't tell the whole story. E. Dames, of Lamborn, Hutchings & Co., reporting on a recent trip said:

"Traveling over the highways, byways, and railroad lines of the South one can hardly fail to be impressed with the volume of cotton which still remains on the farms. Bales repose under trees and canvas as well as under no cover. Cotton is on porches and peeks from open barn doors. In former years it was possible at this season to gage from the ginnings whether or not the peak of the movement had passed. This the trade can no longer do, being thwarted by producers' holdings, financed and not financed, and the cooperative takings . . . It is the most concerted holding move on record . . . This cotton, added to the carry-over, makes for a tremendous supply."

On the consumption side the story is mixed. Actual consumption of raw cotton increased favorably in October, but the rate of takings at mills slowed down. The latter tendency was to be expected after the rush of business in August and September, and observers feel that another buying wave is due in the next month or so. Stocks on hand are at a low level; so increased activity will probably be reflected in larger sales of raw cotton.

Foreign crops like the Indian and Chinese are larger this year, and mills on the Continent are finding it easy to compete with American cotton because of the advantage they have with their depreciated currency. Exports so far, however, have held up well.

Political factors have clouded the business outlook again; so cotton is at present dull, waiting for more positive guides to future action.

In the last 2 days of the week ended October 29 prices in the cotton market lost the gains scored earlier, declining from one to 8 points for the week. Hedge selling, combined with fair weather, was responsible for the selling, as was the decline in stocks and commodities. Wheat reached an all-time low, and traders were pleased that cotton did not sell off more than it did.

At the close November sold at 6.05¢ compared with 6.13¢ the week before; December 6.12 against 6.16; January 6.16 against 6.20; March 6.25 against 6.30; June 6.41 against 6.44; and July 6.47 against 6.48.

The Liverpool market was steady on the basis of a fairly good cotton cloth business.

As the New York Cotton Exchange Service said, "The fresh decline in the pound sterling has placed Lancashire in a slightly better position in competition with Japan in eastern markets."

COTTON BULL POINTS

1. Consumption of cotton in October was 502,244 bales by American mills against 461,023 in the same month last year.
2. Exports for the first 3 months of the season were 2,193,842 bales, compared with 1,783,402 in the same period last year.
3. In the first 9 months this year United States shipments of cotton piece goods abroad were 6% above those last year.
4. Production of carded cotton cloths during October was the highest since April, 1930; stocks on hand were 166,668,000 yards.
5. October operation of the cotton spinning industry were at 97% of capacity against 94⅝% in September and 85⅛% last year.
6. Egyptian acreage will be cut 40 to 50% next year according to a recent decree by the government.
7. Boll weevil will affect sections of the crop next year not previously touched, says the American Cotton Cooperative Assn.
8. German imports of cotton in the first quarter this year were 486,000 bales against 184,000 last season.
9. Night work for women and minors was again decided against by executives at the Spartanburg meeting.
10. World consumption of American cotton in October was 1,200,000 bales against 1,044,000 in October, 1931.

COTTON BEAR POINTS

1. The government increased its crop estimate to 11,947,000 bales this month, 522,000 bales above last month's estimate.
2. Billings of cotton cloth during October at 246,560,000 yards were 97.4% of production; sales were 149,657,000 yards.
3. Ginnings to November 14 were 10,532,745 bales, pointing to a crop of at least 12,000,000 bales.
4. Foreign cotton is competing strongly with American in world markets. American cotton is further handicapped in competing with those countries off the gold standard.
5. The supply of American cotton is about 6,000,000 bales above the 1921-1930 10-year average of 18,400,000 bales.
6. Forwardings of American cotton to the Continent declined last month.
7. The Indian crop this year is put at 5,900,000 bales, making a total of 7,500,000 bales available against 6,900,000 last year. The Chinese crop is expected to increase this year by 40 to 47%.

Week ended November 5. Although cotton prices reached a new low for the month of October on the last day of trading in that month on Monday, the market held steady during the week and rallied well on Friday and Saturday to register net gains of from 25 to 30 points for the week. Reports that the Manchester strike had ended Saturday, together with a good volume of foreign buying, accounted largely for the gain of 24 to 26 points on Saturday.

The November contract closed at 6.30¢ against 6.05¢ the week before; December 6.38 against 6.12; January 6.44 against 6.16; March 6.55 against 6.25; May 6.65 against 6.36; July 6.75 against 6.47; and October 6.90 against 6.60.

The new buying and short covering that featured the market late in the week was ascribed to the belief that the peak of the movement from the South had been passed. Large scale orders came into the market, and dealers had difficulty in supplying tenderable staple. Optimism developed, too, through the resistance of the market to hedge selling and a feeling that the goods markets would pick up following the election.

The next government crop report is due Wednesday. Private estimates indicate a larger forecast than last month. The average of 91 forecasts by members of the Cotton Exchange was 11,410,000 bales, compared with an average last month of 11,191,000 bales, and the government estimate of 11,425,000 bales.

Week ended November 12. The November crop estimate by the government put the crop at 11,947,000 bales as of November 1, or 522,000 bales larger than last month's estimate. Although private forecasts had been predicting a higher crop, the government figures were larger than expected; so prices hit their lowest point for the last 3 months, following the release of the report. The market had been weak on Monday before Election Day, owing to selling ascribed to cooperatives, so the report had little difficulty in sending an already sagging market lower. December hit 5.91¢. But on Thursday and Friday offerings suddenly became scarce, the demand large; so prices regained from 47 to 58 points. On Saturday unexpected hedge selling cut the gain from 15 to 18 points.

For the week, prices averaged from 2 to 8 points higher, with November selling at 6.38¢, compared with 6.30¢ last week; December 6.41 against 6.38; January 6.48 against 6.44; March 6.57 against 6.55; May 6.68 against 6.65; and July 6.78 against 6.75.

The recovery in prices from their lowest levels was considered a good sign, and the business in wholesale dry goods, curtailed by the decline, picked up again with the upturn in raw prices.

October consumption in the United States was estimated by the New York Cotton Exchange Service at 504,000 bales, compared with 461,000 last year. World consumption of U. S. cotton was put at 1,200,000 bales for the same month, compared with 1,044,000 in October, 1931. For the first quarter the figure is estimated at 3,350,000 bales against 2,996,000 last year.

For the November 5 week, the *Times'* index of cotton cloth production dropped to 99.1, against 101.6 for the preceding week and 99.7 for the same week last year. As raw cotton prices advanced in the latter part of the week, buyers returned to the goods market, but not on a large scale.

Week ended November 19. Trading was dull and light during the past week with prices yielding under selling pressure and hedge sales as well as in sympathy with the stock and the grain markets. The October figures from the cotton industry were close to expectations and caused no change in quotations.

For the week the market lost from 28 to 30 points. The November position sold at 6.09¢, compared with 6.38¢ last week; December 6.12 against 6.41; January 6.19 against 6.48; March 6.29 against 6.57; June 6.44 against 6.73; and October 6.62 against 6.92.

October consumption of cotton as reported by the Census Bureau was 502,244 bales of lint, compared with 491,655 in

September this year, and 461,023 in October, 1931.

Exports for the first 3 months of the season were 411,000 bales above those for the same period last season reported the Commerce Department on Tuesday. A total of 2,193,842 bales of cotton worth $89,613,000 was exported in the first 3 months this season against 1,783,402 bales worth $72,918,000 for the same period last season.

Cotton on hand in consuming establishments and public storage at compresses on October 31 was 11,093,691 bales of lint, compared with 9,056,566 at the end of September and 10,568,725 at the end of October, 1931. Active spindles in October were 24,587,732 against 23,883,948 in September and 25,200,056 in October last year.

Carded cotton cloth production during October was 253,109,000 yards, the highest weekly rate since April, 1930, said the Association of Cotton Textile Merchants of New York. Billings, however, dropped to 97.4% of production. The drop was attributed to the high number of sales made in August and September so that a drop in October was almost a natural result. Current production has been cut and was said to have been in line with demand during the November 12 week for the first time in several weeks.

Week ended November 26. In the 3 days preceding the Thanksgiving holiday cotton prices lost from 20 to 25 points. Heavy selling pressure on Wednesday depressed quotations $1 a bale, and the December contract sold down to 5.90¢, 70 points below the best figure in the last fortnight. The news from Washington on war debts was interpreted unfavorably by all markets, with stocks and grains leading the decline.

At the close on Saturday the December position closed at 5.75¢ compared with 6.12¢ last Saturday; January 5.79 against 6.19; March 5.90 against 6.29; May 6.01 against 6.40; and July 6.09 against 6.48.

Ginnings of this year's growth, according to the Census Bureau, were 10,532,745 running bales prior to November 14, compared with 14,207,613 bales last year.

The cotton spinning industry during October operated at 97.0% of capacity on a single-shift basis, compared with 94.6% for September this year, and 85.1% for October last year.

Miscellaneous news revealed that a decree signed in Egypt restricted next year's cotton acreage to 40% for Sakellaridis and 50% for other varieties. American cotton is not being shipped to the Continent so heavily as earlier in the season, but German imports in the first 3 months of the season were 486,000 bales against 184,000 last year. Boll weevils in the field at the end of the picking season infested 69.6% of the squares this year against 25% over last year and 50% above 1928, the worst year for infestation on record.

The Department of Agriculture reports the smallest world cotton crop since 1923-24, placing production at 23,400,000 bales. Important decreases from last year are noted for the United States, Egypt, Brazil, and Mexico; while increases are in prospect for India, China, and Russia. The decrease for the United States accounts for most of the world reduction from last year although the Egyptian crop is reduced one third.

On Friday occurred partial recovery of early losses on futures on better demand for spot goods in addition to improved market conditions affecting wheat and stocks. Spot cotton closed at 5.90¢ on both Friday and Saturday.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. During November the market was inactive for these goods of standard constructions for the rubber trade. The prices were somewhat irregular, and the demand for fabrics slowly improved.

RAINCOAT FABRICS. For the past 2 months the raincoat trade has done very well. The best sellers are bright, highly colored plaids for the Christmas trade, featuring combination sets of raincoat, cap, and umbrella for children's use. Women's printed and other novelty styles are also selling very freely.

SHEETINGS. The hope was not realized that buyers would display more confidence after the election and contract for future delivery. Instead the market for the past few weeks has been very inactive, and prices slightly lower. Buying of consequence is not anticipated until after the turn of the year. With the approach of inventory time most buyers expect to pick up bargains. As has often been the case spring buying may begin the latter part of December or it may hold over until the first part of the new year.

TIRE FABRICS. Consumption of tire fabrics in September was reported at 8,417,417 yards, a decrease of 1,708,413 yards below the consumption in August. The total consumption for the first 9 months of this year amounted to 106,816,120 yards against 9 months' total in 1931 of 125,589,362 yards, a decline of 15%. The market displayed little interest in spot fabrics, and prices were nominally unchanged.

Powdered Rubber

Independent of the Stam process for the mechanical production of rubber in powder form, the Dutch firm, Stork Bros., is constructing an installation for reducing latex to a powder according to a second Dutch patent which has British financial backing. While Stam, who follows the Hopkinson process, claims to have succeeded in producing a perfect powder by adding dextrine to the latex, the experiments with the second patent mentioned have so far yielded a product which is more in the nature of a fine crumb than that of a real powder.

The problem of reducing latex to a perfect powder is still in an experimental stage, for even if a real powder is actually produced, it is not known whether this work could be done economically and on a large scale; whether it would resist all changes of temperature and all pressures, etc. However interesting developments seem to be imminent since it is learned that the backers of the second process have approached Stam to secure collaboration on the 2 patents, and are likely to come to some agreement.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

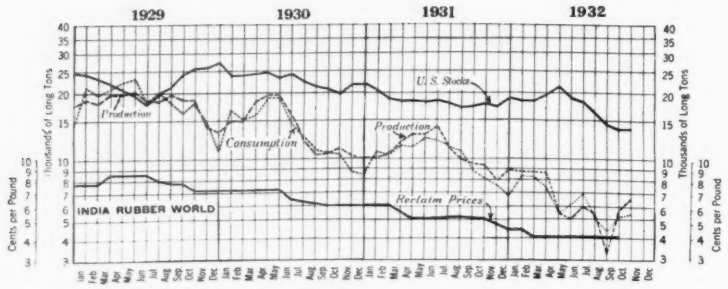
Week Ended	Cents per Pound
Oct. 29	6.31
Nov. 5	6.18
Nov. 12	6.43
Nov. 19	6.37
Nov. 26	6.03

New York Quotations

November 26, 1932

		Cents
Drills		
38-inch 2.00-yd.	yd.	$0.08
40-inch 3.47-yd.		.04⅝
50-inch 1.52-yd.		.10⅞
52-inch 1.90-yd.		.08⅝
52-inch 2.20-yd.		.08
52-inch 1.85-yd.		.08⅞
Ducks		
38-inch 2.00-yd. D. F.	yd.	.08
40-inch 1.45-yd. S. F.		.11
72-inch 1.05-yd. D. F.		.17
72-inch 16.66-oz.		.17¾
72-inch 17.21-oz.		.18¾
MECHANICAL		
Hose and belting	lb.	.18
TENNIS		
52-inch 1.35-yd.	yd.	.12
Hollands		
GOLD SEAL		
40-in., No. 72	yd.	.14
RED SEAL		
36-in.	yd.	.11
40-in.		.11½
50-in.		.17½
Osnaburgs		
40-in. 2.34-yd.	yd.	.06⅞
40-in. 2.48-yd.		.06½
40-in. 3.00-yd.		.05⅜
40-in. 10-oz. part waste		.08
40-in. 7-oz. part waste		.06¼
37-in. 2.42-yd.		.06⅝
Raincoat Fabrics		
COTTON		
Bombazine 60 x 60	yd.	.08¼
Bombazine 60 x 48		.07¾
Plaids 60 x 48		.08¾
Plaids 48 x 48		.07
Surface prints 60 x 60		.09¼
Surface prints 60 x 48		.09
Print cloth, 38½-in., 64 x 60		.03¾
Print cloth, 38½-in., 60 x 48		.03
SHEETINGS, 40-INCH		
48 x 48, 2.50-yd.	yd.	.05¾
48 x 48, 2.85-yd.		.04⅞
64 x 68, 3.15-yd.		.05¼
56 x 60, 3.60-yd.		.04½
44 x 48, 3.75-yd.		.03¾
44 x 40, 4.25-yd.		.03½
SHEETINGS, 36-INCH		
48 x 44, 5.00-yd.	yd.	.03¼
44 x 40, 6.15-yd.		.02⅝
Tire Fabrics		
BUILDER		
17¼ oz. 60" 23/11 ply Karded peeler	lb.	.21½
17¼ oz. 60" 10/5 ply Karded peeler	lb.	.17½
CHAFER		
14 oz. 60" 20/8 ply Karded peeler	lb.	.21½
12 oz. 60" 10/4 ply Karded peeler	lb.	.17½
9¼ oz. 60" 20/4 ply Karded peeler	lb.	.23½
9¼ oz. 60" 10/2 ply Karded peeler	lb.	.18½
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.22¼
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.23¼
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.20¼
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.19¼
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.18¼
23/5/3 Karded peeler, 1¼" cotton	lb.	.28¼
23/5/3 Karded Egyptian	lb.	.34
23/5/3 Combed Egyptian	lb.	.39
LENO BREAKER		
8¼ oz. and 10¼ oz. 60" Karded peeler	lb.	.21½

RECLAIMED RUBBER



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932					
January	8,753	8,440	30.2	18,712	475
February	8,731	8,332	27.6	18,659	484
March	8,613	7,420	26.7	19,726	476
April	5,555	5,561	21.4	21,525	370
May	5,024	6,070	20.8	18,889	188
June	5,923	7,031	18.0	16,870	259
July	5,417	5,131	18.2	16,333	240
August	3,264	4,382	19.6	14,629	147
September	5,308	5,235	23.3	14,059	265
October	6,605	5,494	26.1	13,911	203

*Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

THE use of reclaim in comparison to crude reached a low point in June of this year, but since then the ratio has been climbing very satisfactorily from the viewpoint of reclaimers. At 26.1 for November, the ratio is almost up to the level reached in March.

Part of the reason is that October consumption of crude rubber was abnormally low. It is significant that while crude takings have been steadily decreasing since June, reclaim consumption has not decreased in proportion; in fact it has been increasing during the last few months.

Another factor which puts reclaim in a statistically sound position is the fact that stocks on hand decreased during October and are now at their lowest point while crude stocks are at a record high.

With the low rate of activity in tires and automobile circles it is obvious that these manufacturers did not contribute to the showing of reclaim. Rather the smaller manufacturer is responsible for the showing—the manufacturer who is not burdened with large inventories and heavy overhead and who can compete in a narrow market.

The boot and shoe trade is doing as well as and better than most others. Isolated instances are reported of manufacturers operating at full capacity and even of those who are expanding operations in response to better demand. Mechanical grades come next in the amount of activity. Auto topping makers report fair business; insulated wire is doing fair in the face of a normally duller season: and tire manufacturers are at the foot of the ladder because of the suspension of automotive activity and the lack of replacement demand.

The low price of crude is not so serious a handicap as it was a few months ago since manufacturers have learned that reclaim is necessary for a uniform quality in their finished product, and an improvement in crude prices will only add to the number who are now returning to reclaim.

New York Quotations

November 26, 1932

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	5 /5¼
red	1.20	4¾/5
Auto Tire		
Black	1.21	3¾/4
Black selected tires	1.18	4 /4¼
Dark gray	1.35	5 /5¼
White	1.40	6 /6½
Shoe		
Unwashed	1.60	4¾/5
Washed	1.50	5½/5¾
Tube		
No. 1	1.00	6½
No. 2	1.10	4½/4¾
Truck Tire		
Truck tire, heavy gravity	1.55	5 /5¼
Truck tire, light gravity	1.40	5¼/5½
Miscellaneous		
Mechanical blends	1.60	3 /3½

RUBBER SCRAP

NOVEMBER business in scrap showed no improvement over October's; so prices eased off fractionally. The lower quotations, however, were made only in tires and tubes, with mechanicals and boots and shoes unchanged. The reason, of course, is that automobile production was almost at a standstill during the month except for those manufacturers that were assembling their 1933 models.

It was thought last month that business would improve right after the election, but that has come and gone, and the scrap market, at least, is no better off than before. Little buying is being done; manufacturers are still adhering to their hand-to-mouth schedules, and consumption is at best only fair. The trouble lies in the low prices. Collectors can make no money at the rates being paid, and reclaimers make scarcely more on their finished stock; therefore the remedy lies in better prices generally, which will follow only when crude prices improve and factories operate on a more substantial scale.

BOOTS AND SHOES. In comparison with other grades, boots and shoes are firm. Prices have not changed for 2 months, possibly because they are at rock bottom and demand is good. Returns paid to collectors for boot scrap are so small that it is difficult to satisfy even the limited demand.

INNER TUBES. Fractionally lower prices ruled on No. 1 floating and red tubes, but the demand continued fair. Takings from abroad were again good, with domestic trade falling behind export business.

TIRES. An easy market in tires sent prices lower by 25¢ to $1 a ton in November. The beginning of the normally slack season and the fact that automobile manufacturers closed down to prepare for new models were responsible for the lower prices.

MECHANICALS. This grade was dull and unchanged in price.

HARD RUBBER. Demand was good this month; prices held steady.

CONSUMERS' BUYING PRICES

Carload Lots Delivered Eastern Mills

November 26, 1932

	Prices
Boots and Shoes	
Boots and shoes, black . . 100 *lb.*	$0.75/$0.90
Colored . . . . . 100 *lb.*	.625 /.75
Untrimmed arctics. . . . . 100 *lb.*	.50
Inner Tubes	
No. 1, floating . . . . . *lb.*	.02¾/.02⅞
No. 2, compound . . . . . *lb.*	.01⅝/.01¾
Red . . . . . *lb.*	.01½/.01⅝
Mixed tubes . . . . . *lb.*	.01¾
Tires (Akron District)	
Pneumatic Standard	
Mixed auto tires with beads . . . . . *ton*	7.25/ 7.50
Beadless . . . . . *ton*	10.50/10.75
Auto tire carcass . . . . . *ton*	7.50/ 8.00
Black auto peelings . . . . *ton*	17.50/18.00
Solid	
Clean mixed truck . . . . . *ton*	26.50/27.00
Light gravity . . . . . *ton*	28.00/29.00
Mechanicals	
Mixed black scrap . . . . . *lb.*	.00⅝/.00¾
Hose, air brake . . . . . *ton*	7.50 /8.00
Garden, rubber covered *lb.*	.00⅜/.00½
Steam and water, soft. . . *lb.*	.00⅜/.00½
No. 1 red . . . . . *lb.*	.01⅛/.01¼
No. 2 red . . . . . *lb.*	.01 /.01⅛
White druggists' sundries. *lb.*	.01¼/.01½
Mechanical . . . . . *lb.*	.00¾/.00⅞
Hard Rubber	
No. 1 hard rubber . . . . . *lb.*	.06⅜/.06½

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

MAN, TWENTY-EIGHT, 6 YEARS' BROAD, PRACTICAL, AND technical experience in rubber industry with large companies. Knowledge compounding. Address Box No. 131, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT ENGINEER, WITH past record of accomplishment and mature experience in hard rubber manufacture and merchandising. Can introduce refinements in present manufacture and introduce new lines. Also knowledge of soft mechanical lines. Address Box No. 132, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT MAN, EXPERIENCED in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 133, care of INDIA RUBBER WORLD.

FACTORY SUPERINTENDENT, AGE 41, WITH 22 YEARS OF experience in proofing, calendering, auto cloth, hospital sheetings, heels, cements, etc. Would like to become connected with A-1 concern. Has up-to-date formulæ and can handle the works from start to finish. Address Box No. 137, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: A MAN WHO UNDERSTANDS THE ENTIRE MANUfacture, compounds, etc., of solid rubber dolls and toys, also familiar with manufacture of sheet sponge rubber. State experience and salary expected. Reply at once. Address Box No. 134, care of INDIA RUBBER WORLD.

SITUATIONS OPEN—Continued

WANTED IMMEDIATELY: EXPERIENCED MAN with complete knowledge of compounding, molding, and cutting of sponge rubber weather strips for automobile body original equipment trade. Address Box No. 138, care of INDIA RUBBER WORLD.

SMALL EASTERN RUBBER PLANT WOULD LIKE TO ENTER field making fabrics for shoe trade, including backing, combining, cements, and tapes. Excellent opportunity for right man. Replies strictly confidential. Address Box No. 140, care of INDIA RUBBER WORLD.

IMPORTANT FRENCH BRAKE LINING MANUFACTURER wishes cooperation of engineer well acquainted with brake lining, woven and molded, and also with impregnation. A New York interview will be eventually granted. Address Box No. 141, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

FOR LEASE OR SALE: COMPLETELY EQUIPPED PLANT IN Los Angeles, Calif., suitable for manufacture of mechanicals and sundries. Address Box No. 135, care of INDIA RUBBER WORLD.

FOR SALE: RUBBER PLANT IN EASTERN MASSACHUSETTS, completely equipped for manufacture of molded goods. Address Box No. 139, care of INDIA RUBBER WORLD.

(*Advertisements continued on page 77*)

EDITOR'S BOOK TABLE

New Publications

"Miniature Steam Generators Electric-Heated." Commonwealth Electric & Mfg. Co., 83-105 Boston St., Boston, Mass. This 4-page bulletin describes and illustrates a line of small steam generators making available small quantities of "process" steam at high or low pressures. The apparatus is useful in many industrial operations, also for laboratory, testing, experimental, and semi-plant scale work.

"Rubber Covered Rolls in the Textile Industry." American Wringer Co., Inc., Woonsocket, R. I. This booklet is on the care and protection of rubber rolls used in the textile industry.

"Ace Hard Rubber Products for Industrial Purposes." American Hard Rubber Co., 11 Mercer St., New York, N. Y. This profusely illustrated Catalog No. 1 shows the extensive use and value of hard rubber in industrial equipment. It contains also much valuable data relating to the physical, chemical and electrical properties of hard rubber and notes on stock standard forms and approved shop practice for working hard rubber.

"Proposed Federal Specifications." Federal Coordinating Service, Federal Specifications Board, Washington, D. C. The following specifications, in the formative stage, are submitted to representative manufacturers for their comment and criticism.

ZZ-C-101, Rubber Catheters; No. 223, Rubber Cement for Medical Rubber Goods; No. 230b, Surgical Operating Pads; No. 231a, Rubber Pillowcases; No. 237, Stomach or Lavage Tube; No. 42, Dredging Sleeves; Friction Surface and Rubber Covered Conveyer Belting; ZZ-B-71a, Politzer Bags.

"Annual Report of the Director of the Bureau of Standards to the Secretary of Commerce for the Fiscal Year Ended June 30, 1932." United States Government Printing Office, Washington, D. C. This report covers general activities, expenses, and special investigations. It concludes with a tabulated general financial statement showing that during the fiscal year 1932 the bureau expended and accounted for funds aggregating $3,295,245.37.

"Pension and Family Provision Scheme for Members of the Institution of the Rubber Industry." Institution of the Rubber Industry, Faraday House, 10 Charing Cross Rd., London, W.C.2, England. This 16-page booklet with its 2 inserts explains in detail the scheme adopted by the I.R.I. council after suitable investigation, which makes provision for the needs of the member himself upon retirement and also for his family in the event of premature death. This special arrangement for I.R.I. members is assured by the Legal & General Assurance Society, Ltd., 10 Fleet St., London, E.C.4.

Book Reviews

"Foreign Commerce and Navigation of the United States for the Calendar Year 1931." United States Department of Commerce, Bureau of Foreign and Domestic Commerce, U. S. Government Printing Office, Washington, D. C., 1932. Cloth, 790 pages, 9 by 11½ inches. Indexed.

This annual statistical record presents an analytical summary of the foreign commerce of the United States in the form of tables covering kinds, quantities, and values of exports and imports; general imports; foreign merchandise in transit or transshipped; tonnage tables and tables of weight. Rubber imports, exports, and imports entered for consumption are given for the calendar year 1931.

"The Efficient Control of Production." By Thos. W. Fazakerley. Gee & Co., Ltd., 6 & 8 Kirby St., E.C.1 and 41 Moorgate, London, E.C.2, 1932 Cloth, 73 pages, 5½ by 8½ inches. Price 5/3 postpaid.

This first-hand study of the elements and methods of efficiency control is replete with practical suggestions of value to plant managers, especially those in the rubber industry, because the work is illustrated with many charts and forms devised for efficient control of rubber factory operations.

The topics treated include buildings, machinery, production scheduling and measurement, waste, mechanization of labor, wage payment, engagement and dismissal of operatives, group insurance and other welfare plans, and cost account as efficiency factor.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
*1,641	Flooring	Belgrade, Yugoslavia
‡1,642	Reclaimed rubber	Brandenberg, Germany
†1,647	Shoes	Curacao, Netherland West Indies
†1,648	Shoes	Paramaribo, Surinam
†1,649	Rubber goods	Alexandria, Egypt
*1,673	Sport goods	Glasgow, Scotland
†1,678	Rubberized automobile topping	Buenos Aires, Argentina
*1,716	Scrap rubber, old tires, and red tubes	Buenos Aires, Argentina
*1,717	Tires and tubes	Saloniki, Greece
†1,823	Hosiery savers for inside of shoe heels	Oslo, Norway
†1,833	Tires and tubes, syringe tubing, sponges, football bladders, erasers, and advertising toy balloons	Lisbon, Portugal
†1,857	Sponge rubber cushions	Toronto, Canada
†1,887	Bookbinding materials	Montreal, Canada
*1,888	Scrap rubber	Hamburg, Germany
†1,911	Automobile and truck tires	Guayaquil, Ecuador
*1,971	Erasers	Olomouc, Czechoslovakia

*Purchase. †Agency. ‡ Either.

New Incorporations

The Cape Tire Co., New Bedford, Mass. Capital $25,000. J. Wright, president and treasurer; E. H. Mueller, vice president; W. Goff, secretary.

D. R. G. Purchasing Corp., Oct. 31 (N. Y.), capital 200 shares, no par value. J. Kaslow, L. J. Feldman, and J. Henigson, all of 45 E. 17th St., New York, N. Y. Rubber goods, toys, etc.

The Fall River Tire Co., Fall River, Mass. Capital $25,000. A. J. Burnside, 14 Durfee St., president and treasurer; E. H. Mueller, vice president; W. J. Goff, secretary.

Gould Golf Ball Co., Inc., Nov. 14 (Mass.) H. I. Gould, president; M. J. Durkin, vice president; C. C. Bartlett, treasurer; and H. R. Crocker, clerk. Manufacture golf balls.

Grador Specialty Co., Inc., Oct. 19 (N. Y.), capital $5,000. E. A. Guthman, 1726 E. 22nd St., Brooklyn, A. A. Albert, 43-10 44th St., Queens, and M. F. Phelan, 4118 Hillendale Ave., Little Neck, all in N. Y. Rubber products.

Higbee Rubber Co., Inc., Sept. 28 (N. Y.), capital $10,000. M. D. Higbee, 131 E. Warrington Rd., L. F. Higbee, 134 Clarke St., and M. E. Shields, 130 E. Lafayette Ave., all of Syracuse, N. Y. Rubber products.

Hydraulic & Rubber Machinery Corp., Sept. 10 (N. Y.), capital $10,000. F. Leder, 186 Pulaski St., A. Schlissel, 285 S. Third St., and D. Liebstein, 900 Riverside Dr., all of Brooklyn, N. Y. Rubber goods of all kinds.

Minor Rubber Co., Oct. 10 (N. J.), $25,000. C. W. Humphreys, 20 Oberline Ave., T. T. Horton, 222 Oakland Rd., both of Maplewood, and H. M. Foster, 36 Yates Ave., Newark, all in N. J. Principal office, 972 Broad St., Newark. Manufacture various kinds of rubber goods.

The O'Sullivan Rubber Co., Inc., Sept. 27 (Del.), capital stock 100,000 shares, par value $5.00. M. S. Cook, M. A. Durr, and J. M. Townsend, all of Dover, Del. Manufacture, produce, buy, sell, and deal in rubber and gutta percha and all goods of which they are component parts.

Paragon Vulcanizing Co., Oct. 18 (N. J.), $25,000. M. Geerinck, 138 Franklin St., M. Geerinck, 945 E. 28th St., both of Paterson, and H. Geerinck, 599 Bergen Blvd., Ridgefield, all in N. J. Principal office, 64 Hamilton St., Paterson. Manufacture various kinds of rubber goods.

Denmark

A comprehensive and successful British exhibition was recently held in Copenhagen. At the same time about 100 foreign firms, chiefly English and German, arranged an International Sample Fair, also in Copenhagen. Rubber goods of various kinds were shown at both exhibitions.

Classified Advertisements

CONTINUED

MACHINERY AND SUPPLIES FOR SALE

COMPLETE LINE OF W. & P. MIXERS, VACUUM SHELF DRIERS, calenders, mills, colloid mills, pebble mills, dough mixers, hydraulic presses, pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, N. Y. C.

MACHINERY AND SUPPLIES WANTED

ABRASION TESTING MACHINE. WILL PAY CASH FOR MAchine in good condition. R. R. Bollman, Daylight Bldg., Cincinnati, O.

WANTED: SCOTT RUBBER TESTER, TYPE L3, WITH AUTOgraphic recorder. Address Box No. 136, care of INDIA RUBBER WORLD.

Tire Production Statistics

	Pneumatic Casings—All Types			Solid and Cushion Tires		
	In-ventory	Produc-tion	Total Shipments	In-ventory	Produc-tion	Total Shipments
1929	9,470,368	54,980,672	55,515,884	122,200	407,347	436,027
1930	7,202,750	40,772,378	42,913,108	75,871	204,340	250,635
1931	6,219,776	38,992,220	40,048,552	38,815	136,261	167,555
1932						
Jan.	6,329,417	2,769,988	2,602,469	37,327	8,522	9,488
Feb.	7,337,796	3,096,976	2,042,289	37,242	9,754	9,541
Mar.	7,902,258	2,936,872	2,363,232	36,811	8,796	9,205
Apr.	7,876,656	2,813,489	2,958,104	35,816	7,980	8,436
May	7,502,953	3,056,050	3,406,493	35,179	8,026	8,405
June	3,999,260	4,514,663	8,051,932	22,988	11,170	22,474
July	4,962,285	2,893,463	1,923,276	25,218	9,655	7,104
Aug.	5,327,179	2,471,361	2,123,890	24,814	7,728	7,912
Sept.	4,876,878	2,030,976	2,465,828	23,732	6,755	7,868

	Inner Tubes—All Types			Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	In-ventory	Produc-tion	Total Shipments	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1929	10,245,365	55,062,886	56,473,303	208,824,653	598,994,708	14,748,552,000
1930	7,999,477	41,936,029	43,952,139	158,812,462	476,755,707	16,200,894,000
1931	6,337,570	38,666,376	40,017,175	151,143,715	456,615,428	16,941,750,000
1932						
Jan.	6,175,055	2,718,508	2,803,369	12,156,282	36,850,171	1,112,370,000
Feb.	7,007,567	3,056,988	2,182,405	12,518,243	39,472,356	1,071,840,000
Mar.	7,558,177	2,801,602	2,148,899	11,292,363	36,202,474	1,236,942,000
Apr.	7,552,674	2,579,768	2,708,186	11,083,556	35,416,482	1,270,080,000
May	7,130,625	2,727,462	3,093,593	12,044,956	37,681,119	1,326,738,000
June	4,139,358	4,222,816	7,215,371	17,480,486	57,358,548	1,627,920,000
July	4,779,814	2,349,761	1,727,750	11,706,987	38,406,905	1,315,020,000
Aug.	4,901,884	2,198,560	2,002,347	10,115,830	32,984,219	1,478,694,000
Sept.	4,602,160	2,081,146	2,478,234	8,417,417	27,577,826	1,413,720,000

Rubber Manufacturers Association, Inc., figures representing 80% of the industry since January, 1929, with the exception of gasoline consumption.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for October, 1932:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

	October, 1932	
To	Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	4,192	97
United States	21,042	237
Continent of Europe	7,251	195
British possessions	1,278	16
Japan	3,128	11
Other countries	484	...
Totals	37,375	556

Rubber Imports: Actual, by Land and Sea

	October, 1932	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	473	4,424
Dutch Borneo	379	2,935
Java and other Dutch Islands	75	6
Sarawak	558	25
British Borneo	165	32
Burma	102	4
Siam	162	266
French Indo-China	129	16
Other countries	41	6
Totals	2,084	7,714

Rubber Goods Production Statistics

	1932									1931
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sept.
TIRES AND TUBES										
Pneumatic casings										
Production *thousands*	2,770	3,097	2,937	2,813	3,056	4,515	2,893	2,471	....	2,538
Shipments, total *thousands*	2,602	2,042	2,363	2,958	3,406	8,293	1,923	2,124	....	3,145
Domestic *thousands*	2,545	1,973	2,281	2,886	3,325	8,212	1,845	2,065	....	3,034
Stocks, end of month *thousands*	6,329	7,338	7,902	7,877	7,503	3,700	4,962	5,327	....	6,527
Solid and cushion tires										
Production *thousands*	9	10	9	8	8	11	10	8	....	10
Shipments, total *thousands*	9	10	9	8	8	22	7	8	....	13
Domestic *thousands*	9	9	9	8	8	22	7	7	....	12
Stocks, end of month *thousands*	37	37	37	36	35	23	25	25	....	46
Inner tubes										
Production *thousands*	2,719	3,057	2,802	2,580	2,727	4,223	2,350	2,199	....	2,759
Shipments, total *thousands*	2,803	2,182	2,149	2,708	3,094	7,394	1,728	2,002	....	3,320
Domestic *thousands*	2,761	2,135	2,094	2,658	3,035	7,336	1,674	1,966	....	3,247
Stocks, end of month *thousands*	6,175	7,008	7,008	7,553	7,131	3,943	4,780	4,902	....	6,476
Raw material consumed										
Fabrics *thous. of lbs.*	12,156	12,518	11,292	11,084	12,045	17,480	11,707	10,116	....	9,585
MISCELLANEOUS PRODUCTS										
Rubber bands, shipments *thous. of lbs.*	206	208	223	202	187	180	160	199	210	201
Rubber clothing, calendered										
Orders, net *no. coats and sundries*	20,720	12,388	13,970	7,303	12,503	10,433	9,109	13,321	31,577	23,966
Production *no. coats and sundries*	10,130	20,405	17,649	9,711	12,886	15,333	26,849	28,284	22,770	22,728
Rubber-proofed fabrics, production, total *thous. of yds.*	2,184	2,448	2,462	2,092	1,748	2,243	2,013	2,952	...	4,692
Auto fabrics *thous. of yds.*	339	233	312	202	197	308	224	268	301	528
Raincoat fabrics *thous. of yds.*	853	883	754	701	556	744	1,003	1,489	....	2,988
Rubber flooring, shipments *thous. of sq. ft.*	358	376	422	546	399	546	329	434	421	595
Rubber and canvas footwear										
Production, total *thous. of pairs*	3,557	3,777	3,787	4,104	4,518	4,429	2,321	3,576	....	3,934
Tennis *thous. of pairs*	2,496	3,226	3,187	3,446	3,485	2,898	1,197	1,375	....	1,012
Waterproof *thous. of pairs*	1,061	552	600	657	1,033	1,531	1,124	2,201	....	2,922
Shipments, total *thous. of pairs*	3,990	4,454	4,998	5,073	5,049	4,345	2,985	3,342	....	5,706
Tennis *thous. of pairs*	2,374	3,411	4,264	4,374	4,603	3,839	1,778	1,208	....	1,335
Waterproof *thous. of pairs*	1,616	1,043	735	698	446	506	1,206	2,134	....	4,371
Shipments, domestic, total *thous. of pairs*	3,962	4,416	4,943	5,010	4,966	4,285	2,942	3,272	....	5,448
Tennis *thous. of pairs*	2,353	3,378	4,216	4,333	4,530	3,786	1,755	1,175	....	1,263
Waterproof *thous. of pairs*	1,610	1,038	727	677	436	499	1,187	2,096	....	4,185
Stocks, total, end of month *thous. of pairs*	20,237	19,551	19,347	18,381	17,879	17,962	17,317	17,358	....	20,615
Tennis *thous. of pairs*	8,510	8,264	8,191	7,267	6,163	5,222	4,641	4,615	....	5,473
Waterproof *thous. of pairs*	11,726	11,287	11,156	11,115	11,716	12,741	12,676	12,743	....	15,141
Rubber heels										
Production *thous. of pairs*	12,316	14,787	16,368	11,737	10,259	11,299	9,868	11,073	....	15,827
Shipments										
Export *thous. of pairs*	290	259	305	280	275	266	261	187	....	501
Repair trade *thous. of pairs*	3,431	4,575	3,785	2,656	3,651	3,708	2,449	4,260	....	6,994
Shoe manufacturers *thous. of pairs*	8,704	8,748	9,424	6,938	6,345	8,330	7,432	9,948	....	9,724
Stocks, end of month *thous. of pairs*	24,515	25,807	27,933	28,340	28,782	27,736	27,397	24,449	....	23,952
Rubber soles										
Production *thous. of pairs*	3,411	3,461	3,953	2,292	2,488	2,461	2,419	2,599	....	2,880
Shipments										
Export *thous. of pairs*	8	3	2	1	4	5	14	12	....	90
Repair trade *thous. of pairs*	264	285	252	252	151	133	113	140	....	290
Shoe manufacturers *thous. of pairs*	2,954	2,925	3,320	2,087	2,549	2,362	2,280	2,508	....	2,604
Stocks, end of month *thous. of pairs*	2,085	2,428	2,691	2,759	2,434	2,374	2,308	2,373	....	2,264
Mechanical rubber goods, shipments										
Total *thous. of dollars*	2,463	2,446	2,638	2,613	2,542	2,672	2,024	2,152	....	3,015
Belting *thous. of dollars*	483	483	491	430	420	526	524	563	....	788
Hose *thous. of dollars*	903	966	1,174	1,251	1,131	1,095	734	785	....	1,041
Other *thous. of dollars*	1,077	997	973	932	991	1,051	766	804	....	1,186

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

U. S. Crude and Waste Rubber Imports for 1932

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1932	Totals 1931	Balata	Miscellaneous	Waste
Jan. ....*tons*	30,847	271	142	38	..	..	..	31,298	37,098	53	731	50
Feb.	30,041	361	144	..	..	..	..	30,546	36,645	98	689	..
Mar.	41,753	335	240	54	..	..	..	42,382	40,338	65	754	25
Apr.	36,390	516	111	..	..	..	..	37,017	46,648	35	421	..
May	32,030	82	81	31	..	..	..	32,224	31,720	72	645	30
June	41,070	290	34	..	..	..	..	41,394	45,776	17	415	..
July	30,822	212	44	..	..	..	..	31,078	41,004	57	505	..
Aug.	33,939	260	20	..	..	..	..	34,219	38,370	25	437	9
Sept.	29,311	95	101	2	..	..	..	29,509	40,505	20	257	..
Oct.	34,652	689	122	10	..	..	..	35,473	41,395	77	531	11
Total, 10 mos., 1932 ....*tons*	340,855	3,111	1,039	135	..	..	..	345,140	.....	519	5,385	125
Total, 10 mos., 1931 ....*tons*	391,377	3,292	4,669	160	1	..	..	.....	399,499	1,111	6,795	181

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States Imports[1]

	First 9 Months 1931	First 9 Months 1932
Druggists rubber sundries....	$132,150	$89,249
Hard rubber combs.....	224,367	131,047
Other hard rubber manufactures	120,410	17,553
Rubber toys and balloons.....	114,973	101,186
Other rubber manufactures...	307,764	202,404

Countries	First 9 Months, 1932 Druggists' Sundries	Rubber Toys and Balloons
Austria	$5,474	$14,670
Czechoslovakia	1,629	17
France	5,699	338
Germany	50,861	23,502
Hungary	.....	7,110
Norway	5	.....
United Kingdom	24,550	180
Canada	.....	8
Japan	1,031	55,361
Total	$89,249	$101,186

[1] From Special Circular No. 3,364, Rubber Division, Department of Commerce, Washington, D. C.

United States Statistics

Imports of Crude and Manufactured Rubber

	August, 1931 Pounds	August, 1931 Value	August, 1932 Pounds	August, 1932 Value
UNMANUFACTURED—*Free*				
Crude rubber	86,617,676	$5,138,404	74,926,261	$2,027,045
Liquid latex	816,010	60,358	1,208,575	59,178
Jelutong or pontianak....	1,461,110	100,536	822,589	46,926
Balata	163,130	20,207	79,531	8,885
Gutta percha	54,661	6,057	.....	.....
Siak, scrap, and reclaimed..	792,526	5,190	296,661	3,082
Totals	89,905,113	$5,340,752	77,333,617	$2,145,116
Chicle, crude .....*Free*	624,405	$277,395	177,829	$63,662
MANUFACTURED—*Dutiable*				
Tires .....*number*	7,329	$5,670	1,376	$11,811
Other rubber manufactures..	.....	53,184	.....	63,089
Totals	.....	$58,854	.....	$74,900

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	5,205,201	$345,953	3,167,012	$136,956
Balata	2,619	518	5,621	1,093
Guayule	5,600	686	4,600	552
Gutta percha, rubber substitutes, and scrap.....	.....	.....	50	31
Rubber manufactures	.....	6,478	.....	57
Totals	.....	$353,635	.....	$138,689

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	917,917	$40,338	328,921	$12,609
Scrap and old.....	5,841,788	96,842	3,113,988	49,507
Rubberized automobile cloth, *sq. yd.*	84,802	34,583	55,266	21,418
Other rubberized piece goods and hospital sheeting.*sq. yd.*	89,669	38,900	33,533	12,357
Footwear				
Boots .....*pairs*	104,265	239,303	10,212	20,873
Shoes .....*pairs*	78,880	64,393	26,628	21,354
Canvas shoes with rubber soles ... .*pairs*	98,015	53,591	18,494	10,045
Soles .....*doz. pairs*	9,759	25,674	2,264	5,158
Heels .....*doz. pairs*	47,415	29,810	23,978	13,304
Water bottles and fountain syringes .....*number*	46,721	21,972	22,500	7,573
Gloves .....*doz. pairs*	8,752	19,817	3,712	8,275
Other druggists' sundries....	.....	22,964	.....	17,486
Balloons .....*gross*	60,330	53,766	13,112	13,354
Toys and balls.....	.....	10,676	.....	8,460
Bathing caps .....*doz.*	4,768	9,994	2,303	3,740
Bands	27,814	9,683	15,368	4,138
Erasers	21,449	14,049	21,088	11,775
Hard rubber goods				
Electrical goods	137,633	16,096	142,936	7,634
Other goods	.....	17,431	.....	8,559
Tires				
Truck and bus casings, *number*	26,442	456,639	16,620	251,722
Other automobile casings *number*	116,904	880,288	49,431	304,128
Tubes, auto.....*number*	99,096	122,603	40,731	41,369
Other casings and tubes, *number*	5,861	14,300	3,029	7,046
Solid tires for automobiles and motor trucks.*number*	807	24,967	608	16,930
Other solid tires.....	139,380	16,339	89,292	10,469
Tire sundries and repair materials	.....	76,117	.....	32,563
Rubber and friction tape....	87,668	21,249	50,800	9,974
Belting	262,526	107,649	103,423	41,644
Hose	341,606	99,688	161,904	41,199
Packing	97,031	42,254	62,751	24,971
Thread	111,113	70,689	115,523	61,271
Other rubber manufactures..	.....	118,868	.....	62,223
Totals	.....	$2,871,442	.....	$1,163,128

London Stocks, September, 1932

LONDON	Landed Tons	Delivered Tons	Stocks, September 30 1932 Tons	1931 Tons	1930 Tons
Plantation	3,156	5,265	44,901	79,627	83,219
Other grades	7	35	41	35	52
LIVERPOOL					
Plantation	*2,556	*1,643	*58,149	*54,612	*34,718
Total tons, London and Liverpool	5,719	6,943	103,091	134,274	117,989

*Official returns from the recognized public warehouses.

World Rubber Shipments—Net Exports

British Malaya	Long Tons—1932 Apr.	May	June	July	Aug.	Sept.	Oct.
Gross exports 36,670	40,297	36,566	40,723	39,337	41,973	37,931	
Imports	4,682	5,677	5,665	5,346	7,371	8,869	9,798
Net 31,988	34,620	30,901	35,377	31,966	33,104	28,133	
Ceylon	3,210	3,824	3,444	3,501	4,717	4,361	3,563
India and Burma....	365	304	359	99	129	122	....
Sarawak	459	595	481	442	506	614	583
British N. Borneo....	400	400	234	350	*350	*350	*350
Siam	130	118	166	184	300	340	428
Java and Madura....	6,722	6,552	5,610	5,779	4,803	3,858	....
Sumatra E. Coast...	6,090	6,551	7,516	6,257	4,882	6,485	....
Other N. E. Indies...	4,935	6,012	5,507	6,145	7,244	7,664	....
French Indo-China...	962	964	1,218	1,233	*1,164	*1,632	*779
Amazon Valley.....	487	416	394	232	303	318	....
Other America.....	10	....	14	....	....	....	....
Guayule	....	....	....	....	....	....	....
Africa	89	278	125	141	*120	*120	*120
Totals 55,847	60,634	55,969	59,740	56,484	58,968	....	

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

World Rubber Absorption—Net Imports

CONSUMPTION	Long Tons—1932 July	Aug.	Sept.
United States	28,364	22,445	22,565
United Kingdom	7,507	8,436	6,901
NET IMPORTS			
Australia	624	751	.....
Austria	295	117	195
Belgium	723	1,211	.....
Canada	1,529	970	2,770
Czechoslovakia	1,207	557	.....
Denmark	51	69	90
Finland	62	21	36
France	3,125	4,919	5,845
Germany	3,380	4,006	3,674
Italy	1,116	1,615	.....
Japan	2,544	3,390	5,878
Netherlands	†214	†66	103
Norway	148	82	104
Russia	1,735	1,740	.....
Spain	258	210	.....
Sweden	523	439	.....
Switzerland	27	49	62
Others	*800	*800	*800
Totals	54,232	51,893	.....
Minus United States (Cons.).....	28,364	22,445	22,565
Total foreign	25,868	29,448	...

*Estimate to complete table.
†Indicating excess of reexports over imports.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.